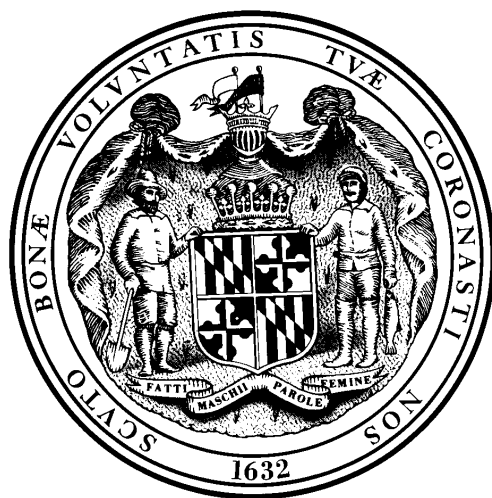


# MARYLAND CLEAN WATER ACTION PLAN

*Final 1998 Report on Unified Watershed Assessment,  
Watershed Prioritization and Plans for Restoration Action Strategies*



**Parris N. Glendening**  
Governor

**Kathleen K. Townsend**  
Lieutenant Governor

*Produced by*

Clean Water Action Plan Technical Workgroup

*Under the Guidance of*

Maryland Bay Cabinet

Maryland State Conservationist

Representatives of Local Governments and

Maryland's Tributary Teams

**31 December 1998**

*P*resident Clinton's national **Clean Water Initiative** to restore and protect streams, rivers, lakes, estuaries, and coastal bays of the United States is an effort we in Maryland wholly endorse and support as it is, in many ways, patterned after our own initiatives to preserve and protect our precious Chesapeake Bay. Therefore, we have been very pleased to note the progress we Marylanders have made to implement this strategy. We commend those who have already invested their time and energy into this initiative, and we encourage those whose task it will be to implement this plan to keep in mind, that as President Clinton said that we must act now to provide "new protections to give all our children the gift of clean, safe water in the 21st century."

**Parris N. Glendening**  
Governor

**Kathleen K. Townsend**  
Lieutenant Governor

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For additional information about the Maryland Clean Water Action Plan,  
visit the State's various World Wide Web sites:

Department of Agriculture - <http://www.mda.state.md.us>

Department of the Environment- <http://www.mde.state.md.us>

Department of Natural Resources - <http://www.dnr.state.md.us>

*et* This electronic text was produced by the Maryland Department of Natural Resources.  
Except for this message, this electronic version of the Maryland Clean Water Action Plan  
is a duplicate of version 1.2 of the final report produced on 31 December 1998.

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## CONTENTS

INTRODUCTION .....	1
UNIFIED WATERSHED ASSESSMENT	
Purpose .....	3
Watershed Scale .....	3
Overall Goals .....	4
Watershed Assessment Methods .....	6
Category 1 (Restoration) Watersheds .....	7
Category 2 (Preventative Action) Watersheds .....	8
Category 3 (Protection) Watersheds .....	8
Category 4 Watersheds (Insufficient Data) .....	22
Results .....	27
WATERSHED RESTORATION PRIORITIES .....	29
PUBLIC INVOLVEMENT PROCESS .....	35
WATERSHED RESTORATION ACTION STRATEGIES .....	37
CONCLUSIONS .....	39
GLOSSARY .....	41

Appendix I - Relationship between State watersheds and federal basins

Appendix II - List of contacts sent requests for supplemental data

Appendix III - Summary of indicators selected to identify Category 1 and 3 watersheds

Appendix IV - Example watershed profile

Appendix V - Public outreach meetings

## TABLES

1. Benchmarks/thresholds for Category 1 (Restoration) watersheds .....	8
2. Category 1 data by Maryland watershed	
Table 2a - water quality indicators .....	9
Table 2b - living resource indicators .....	11
Table 2c - landscape indicators .....	14
3. Benchmarks/thresholds for Category 3 (Protection) watersheds .....	17
4. Category 3 data by Maryland watershed	
Table 4a - living resource indicators .....	17
Table 4b - landscape indicators .....	20
5. Category 1 (Restoration) watersheds .....	24
6. Category 3 (Protection) watersheds .....	26
7. Federal Category 1 (Restoration) basins .....	27
8. Category 1 Priority (Restoration) watersheds .....	30
9. Watersheds sharing Category 1 Priority and Selected Category 3 characteristics .....	31
10. Federal Category 1 Priority basins .....	33

## FIGURES

1. Federal basins in Maryland .....	4
2. State watersheds .....	5
3. Category 1 (Restoration) watersheds .....	23
4. Category 3 (Protection) watersheds .....	25
5. Selected Category 3 (Protection) watersheds .....	27
6. Federal Category 1 (Restoration) basins .....	28
7. Category 1 Priority (Restoration) watersheds .....	31
8. Watersheds sharing Category 1 Priority and Selected Category 3 characteristics .....	32
9. Federal Category 1 <u>Priority</u> basins .....	33

## INTRODUCTION

The Clean Water Action Plan was unveiled by President Clinton in February 1998. This Plan proposes a new collaborative effort by state, federal, and local governments, the private sector and the public to restore those watersheds not meeting clean water and other natural resource goals and to sustain healthy conditions in watersheds that currently meet these goals. The Clean Water Action Plan addresses all aspects of watershed condition: water quality, including public health issues; aquatic living resources; physical habitat and the landscape. The key steps in this national effort are:

**Unified Watershed Assessment** - The Unified Watershed Assessment (UWA) uses the best available information to assess the condition of each State's watersheds, identify watersheds in need of restoration, identify watersheds that need preventive action to sustain water quality and aquatic resources, and identify pristine or sensitive watersheds that need extra protection.

**Watershed Restoration Priorities** - Based on the UWA, States will establish watershed restoration priorities by October 1998. This involves selecting those watersheds not meeting clean water and other natural resource goals that are most in need of restoration actions during the next two years.

**Watershed Restoration Action Strategies** - will identify the most important causes of water pollution and resource degradation, detail the actions needed to address these problems, and set milestones by which to measure progress. Funds available to federal agencies through the federal FY 1999 Clean Water and Watershed Restoration Budget Initiative will be used to help States implement these strategies.

This report describes Maryland's Unified Watershed Assessment, Watershed Restoration Priorities and process under development to identify and implement Watershed Restoration Action Strategies. It was prepared by the Maryland Clean Water Action Plan Technical Workgroup and subject to policy review by a group including Maryland's Chesapeake Bay Cabinet Secretaries and the Maryland Natural Resource Conservation Service State Conservationist. Comments received from other local governments, State and federal agencies, interest groups and the public based on draft reports produced in August and October 1998 were considered in this revision of the report. Also, public comments received through mid-October and comments received during six regional workshops held in cooperation with the Tributary Strategies Teams in September 1998 were considered. The Technical Workgroup established a committee focused on drinking water sources to review the CWAP information in these watersheds in response to comments received about the poor weighting given to these watersheds given their import as a human health issue.

Final recommendations on the Technical Committee's Priority Restoration watersheds and Selected Protection watersheds were forwarded to the Clean Water Action Plan Steering Committee on December 21, 1998. This report includes those final recommendations.

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# UNIFIED WATERSHED ASSESSMENT

## Purpose

The purpose of the Unified Watershed Assessment is to assess the condition of Maryland's watersheds and, based on watershed condition, classify the watersheds into the following categories:

Category 1 - Watersheds not meeting clean water and other natural resource goals and needing restoration

Category 2 - Watersheds currently meeting goals that need preventive actions to sustain water quality and aquatic resources

Category 3 - Pristine or sensitive watersheds that need an extra level of protection

***NOTE:** The Clean Water Action Plan and the final federal Guidelines issued on June 9, 1998, applied Category 3 only to watersheds on state or federal lands. Maryland is applying this category to all of the State's watersheds, since the identification of watersheds throughout the state that either contain pristine watershed resources or are particularly sensitive can assist many local and state programs beyond the Clean Water Action Plan, such as Rural Legacy and incentive programs for stream buffers and wetland restoration.*

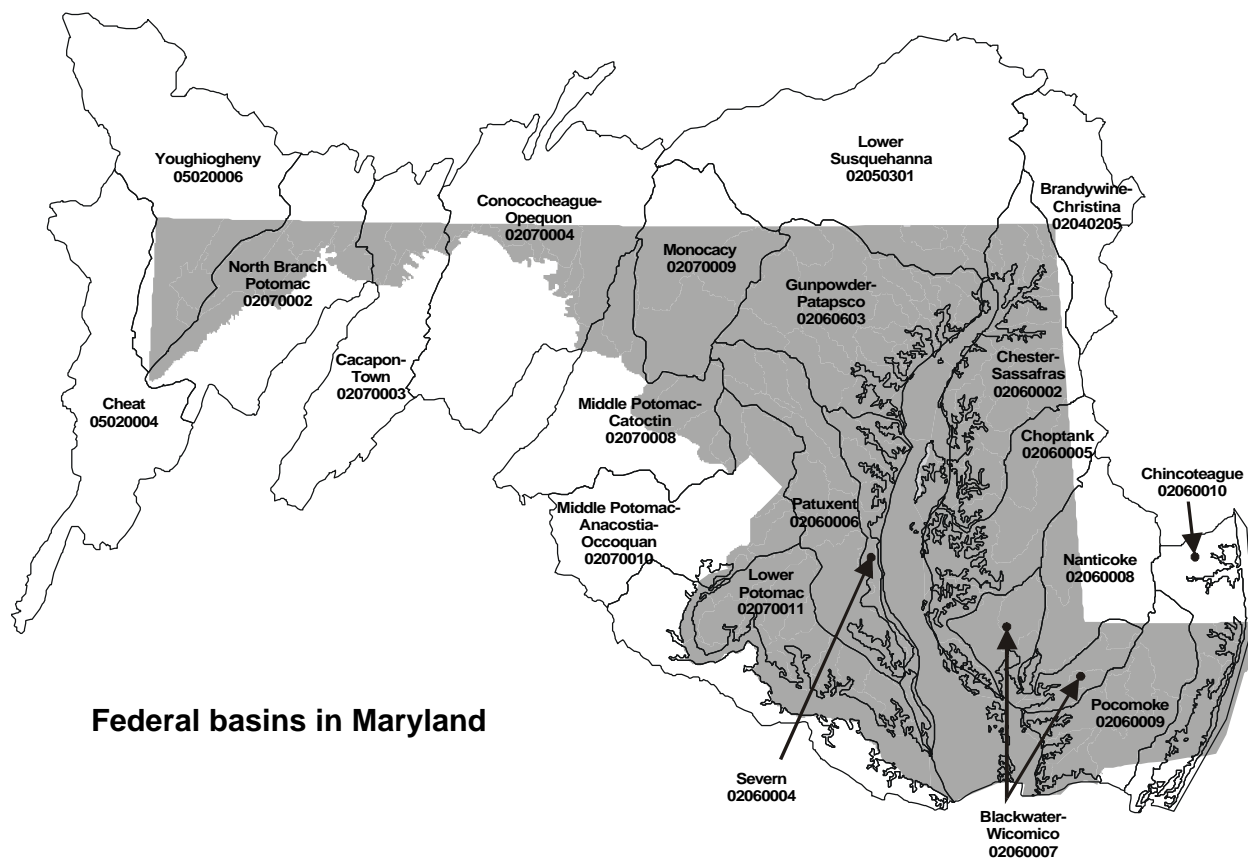
Category 4 - Insufficient data

The Unified Watershed Assessment (UWA) provides the foundation for setting watershed restoration, protection, and preservation priorities. Accordingly, the UWA needs to consider all components of the watershed related to aquatic systems including biological, physical, and chemical characteristics and related landscape factors.

## Watershed Scale

States are able to make assessments for watersheds at multiple scales under the Clean Water Action Plan, but the hydrologic unit "basins" established by the U.S. Geological Survey are to serve as the common scale for unified watershed assessments at the national level. There are portions of 20 of these federal basins in Maryland (**Figure 1**), with an average area in Maryland of about 500 square miles (for comparison, the average area of a Maryland county is about 400 square miles). The condition of the Maryland portion of these federal basins can be determined either directly or as a result of aggregation of assessments of smaller watersheds. Maryland has chosen the latter approach because information at smaller watershed scales will be invaluable when Watershed Restoration Action Strategies are prepared.

Maryland has identified smaller watersheds (**Figure 2**) at scales that, for the most part, fall inside or "nest" within the larger federal basins. For this report, the State's assessment is focused on smaller watersheds. There are 138 of these State-defined "8-digit" watersheds in Maryland, each with an average area of about 75 square miles. The relationships between the State's Tributary Strategy watersheds, the State's "8-digit" watersheds and the federal hydrologic units are shown in **Appendix I**.



**Figure 1.**

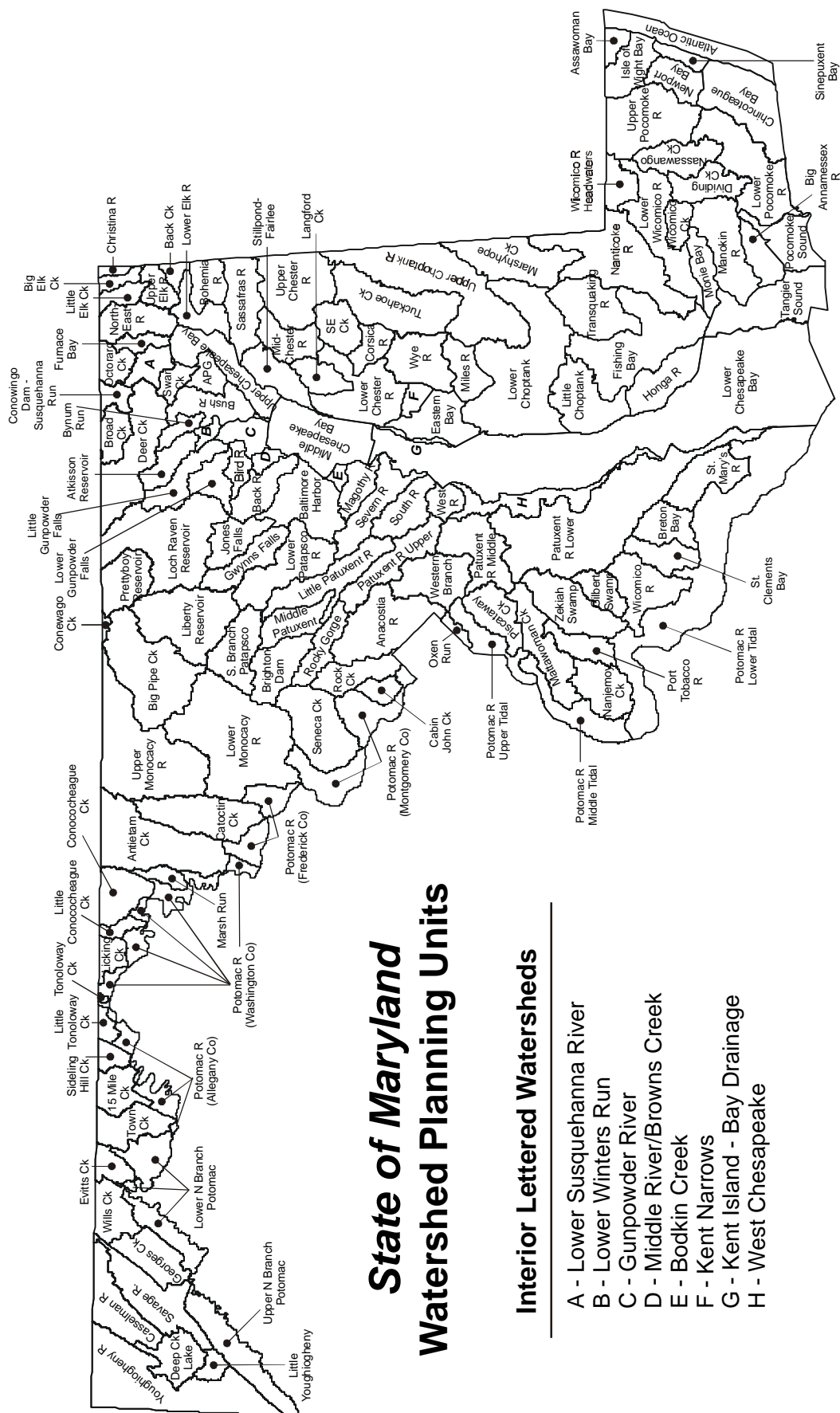
Local governments and other agency studies may identify even smaller watersheds that nest within this Statewide system. Identifying intensive monitoring and restoration activities by state and local governments or non-governmental organizations within these sub-watersheds may be desirable when reviewing watershed priorities or establishing watershed restoration action strategies.

### Overall Goals

Two overarching goals were considered in the assessment of Maryland watersheds:

- **Clean Water Goals** - Maryland watersheds should meet water quality standards, including numerical criteria as well as narrative standards and designated uses.
- **Other Natural Resource Goals** - Watersheds should achieve healthy conditions as indicated by natural resource indicators related to the condition of the water itself (e.g. water chemistry), aquatic living resources and physical habitat, as well as landscape factors (e.g. buffered streams and wetland restoration).

Figure 2.



### Clean Water Goals

To evaluate *clean water goals*, the assessment generally examined single factors that result in, or cause, a violation of the numeric/narrative water quality standards described in the Code of Maryland Regulations (§26.08.02). The State's biennial water quality report, required by Section 305(b) of the Federal Water Pollution Control Act Amendments, is a primary source of information about water quality impairments in the State. This report provides a summary of violations of State water quality standards as well as information about defined use impairments such as shellfish harvesting closures, swimming and water contact bans, fish consumption advisories. Much of the summary data about impaired waters and violations of State water quality standards in the 305(b) report are used to develop the list of impaired waters required under Section 303(d) of the Act. The final, EPA-approved listing of impaired waters on the State's 303(d) list through 1998 was incorporated in this Unified Watershed Assessment report.

### Other Natural Resource Goals

To evaluate *other natural resource goals*, multiple and cumulative impacts that prevent watersheds from achieving healthy watershed conditions were assessed using selected natural resource indicators (listed below). These indicators relate to the condition of water chemistry, aquatic living resources, physical habitat and landscape.

Initial assessments used existing data from state monitoring and assessment programs. These constitute the core data for the Unified Watershed Assessment. In addition, supplemental information was solicited from several hundred individuals and organizations, such as local governments and community watershed associations, encouraging them to submit available water quality and aquatic resource information (**Appendix II**). Some supplemental data was received and results were evaluated and applied to assessment and prioritization activities.

## **Watershed Assessment Methods**

In this section, the term "indicator" is widely used. Assessing the condition of the State's water quality and natural resources is a difficult undertaking. Not only are these natural conditions complex, but various human activities and impacts adds to the level of complexity.

One way to present the condition of our watersheds is to develop understandable measures or indicators that provide information about these resources. Scientists, managers and the public can use this information to determine the status of these resources, determine information about the pressures that degrade environmental quality, evaluate programs or changes in behavior designed to improve the environment. Over time, indicators help us measure our progress towards meeting our goals.

### Category 1 (Restoration) Watersheds

Both the violation of water quality standards, as reflected by inclusion on the 303(d) List, as well as poor values for other natural resource indicators, are used as criteria for determining whether a watershed is classified as a Category 1 watershed “in need of restoration”:

- waters that appear on the 303(d) List are identified as Category 1 watershed and require some restoration action(s) in order to meet water quality standards (some of these watersheds also may require restoration in order to meet other natural resource goals); or
- waters that are not on the 303(d) List, but require restoration in order to meet other two or more natural resource goals are identified as Category 1 watersheds.

Many data sets that could be used as natural resource indicators were examined. A minimal number of indicators were selected that would provide the most accurate, non-duplicative, and comprehensive assessment of watershed condition. These indicators could be grouped into several major “clusters” that focused on the key areas of watershed condition:

- Water Chemistry
  - \* Monitored data for nutrients (total nitrogen, total phosphorus), suspended sediments, and indicators of over-enrichment (chlorophyll a, summer bottom dissolved oxygen and Secchi depth)
  - \* Modeled nutrient loadings (total nitrogen and total phosphorus)
- Aquatic Living Resources
  - \* Submerged aquatic vegetation coverage and habitat requirements
  - \* Indices of the health of tidal and non-tidal fish and benthic communities
- Instream physical habitat
- Landscape
  - \* Impervious surface
  - \* Population density
  - \* Historic wetland loss
  - \* Unbuffered streams
  - \* Soil erodibility

Data sources and methods of calculation for these indicators are briefly discussed in **Appendix III**. More information about these indicators are available as “metadata” on the State’s Clean Water Action Plan Internet site ([www.dnr.state.md.us/cwap/metadata.pdf](http://www.dnr.state.md.us/cwap/metadata.pdf)). A set of ~~A~~watershed profiles~~@~~for each of the State watersheds that summarizes these indicators is available in a separate report (Maryland Watershed Profiles, MD Dept. Natural Resources, 1998); an example is shown in **Appendix IV** of this report. Each profile includes a detailed map of the watershed, including sub-watershed boundaries, and a summary listing of data for the watershed).

To determine if a watershed does not meet a Natural Resource Goal, one of two decision-making criteria is used:

- An indicator value does not meet an established goal or benchmark level; or
- An indicator for which there is no established goal or benchmark level has a value among the worst 25 percent of all watersheds assessed by that indicator.

As an example of the first case, a Non-tidal Fish Index of Biotic Integrity score less than 6.0 indicates that fish communities in the watershed's streams are in poor condition, so the basin fails to meet that Natural Resource Goal. As an example of the second case, a watershed where the impervious surface coverage indicator was among the highest (i.e. worst) 25 percent among the State's watersheds would identify that basin as failing to meet that Natural Resource Goal.

Application of these criteria is described in **Appendix III**. Benchmarks or thresholds for each indicator are listed in **Table 1** and the resulting data for each watershed are listed in **Table 2**.

**Table 1. Benchmarks/thresholds for Category 1 (Restoration) watersheds**

Condition of...	Indicator	Benchmark
<b>Water quality</b>	Monitored Nutrient Concentrations: eutrophication	lowest 25 %
	Monitored Nutrient Concentrations: habitat	lowest 25 %
	Modeled Nitrogen and Phosphorus Loading Rate	highest 25 %
<b>Aquatic Living Resources</b>	SAV Abundance	score = 1
	SAV Habitat Index	score < 7
	Tidal Benthic Index of Biotic Integrity	score < 6
	Tidal Fish Index of Biotic Integrity	lowest 25 %
	Anadromous Fish Index	lowest 25 %
	Non-Tidal Benthic Index of Biotic Integrity	score < 6 (sample $n \geq 4$ )
	Non-Tidal Fish Index of Biotic Integrity	score < 6 (sample $n \geq 4$ )
	Non-Tidal Instream Habitat Index	lowest 25 %
<b>Landscape Parameters</b>	Percent Impervious Surface	highest 25 %
	Population Density	highest 25 %
	Historic Wetland Loss Density	highest 25 %
	Percent Unbuffered Streams	highest 25 %
	Soil Erodibility	score $\geq 0.275$
<b>Clean Water Requirements</b>	303d List	presence

### **Category 2 (Preventative Action) Watersheds**

To identify watersheds needing preventative actions to sustain water quality and aquatic life, the application of Category 1 indicators was modified to identify these watersheds. As such, any watershed that is not on the 303(d) List and meets all or all but one of the available Category 1 benchmarks in **Table 1** was placed in Category 2.

### **Category 3 (Protection) Watersheds**

Indicators selected to identify watersheds needing restoration (Category 1) are not necessarily the same indicators that might be used to identify pristine or high quality (Category 3) watersheds that might need additional levels of protection.

Many data sets were examined that would provide an accurate, unique and comprehensive assessment of desired, high quality water quality, natural resource or landscape conditions. Some of the selected Category 3 living resources indicators for pristine watersheds are the same as Category 1 indicators for watersheds needing restoration while others are not. For example, there are no tidal watersheds considered to have pristine or sensitive benthic communities, so the Tidal Benthic IBI used for Category 1 watersheds is not used to help identify Category 3 watersheds.

**Table 2a. Category 1 data (water quality indicators).**

(NOTE: Grey-shaded values exceed benchmark or goal. Segments are listed by watershed code)

MD 8-digit Code	Watershed Name	No. of State 303(d) Impairment	Non-Tidal Total P Index	Non-Tidal Total N Index	Tidal Habitat Index	Tidal Eutroph Index	Modeled Total N Load (lbs/ acre)	Modeled Total P Load (lbs/ acre)
02050301	Conewago Creek	0					11.73	0.50
02120201	L Susquehanna R.	3	9.0	8.0			9.31	0.43
02120202	Deer Creek	0	9.0	4.0			6.81	0.49
02120203	Octoraro Creek	0					7.59	0.58
02120204	Conowingo Dam/Susq	2					9.22	0.41
02120205	Broad Creek	0					11.40	0.63
02130101	Atlantic Ocean	0						
02130102	Assawoman Bay	2			category 1	category 2		
02130103	Isle of Wight Bay	1			category 1	category 2		
02130104	Sinepuxent Bay	1			category 2	category 2		
02130105	Newport Bay	1			category 1	category 2		
02130106	Chincoteague Bay	1			category 2	category 2		
02130201	Pocomoke Sound	1			8.0	4.3	5.70	0.36
02130202	Lower Pocomoke R.	3			6.0	6.7	9.71	0.77
02130203	Upper Pocomoke R.	2					10.41	0.75
02130204	Dividing Creek	3					5.63	0.35
02130205	Nassawango Creek	2					6.70	0.44
02130206	Tangier Sound	2			7.7	6.2	1.55	0.09
02130207	Big Annemessex R.	0			8.7	6.7	6.11	0.40
02130208	Manokin River	3			7.0	4.3	7.27	0.44
02130301	Lower Wicomico R.	3			6.0	4.7	11.59	0.83
02130302	Monie Bay	1					4.19	0.23
02130303	Wicomico Creek	2					7.36	0.50
02130304	Wicomico R. Head	3					10.44	0.65
02130305	Nanticoke River	1			6.5	4.7	7.77	0.50
02130306	Marshyhope Creek	2					12.87	0.90
02130307	Fishing Bay	0			7.7	4.7	3.80	0.22
02130308	Transquaking River	2					7.75	0.62
02130401	Honga River	3					1.97	0.09
02130402	Little Choptank	2			7.0	7.3	3.73	0.24
02130403	Lower Choptank	4			6.3	5.9	6.77	0.60
02130404	Upper Choptank	3	9.0	8.0	6.3	5.9	9.21	0.75
02130405	Tuckahoe Creek	3					9.66	0.75
02130501	Eastern Bay	3			7.0	7.3	3.18	0.23
02130502	Miles River	3					8.72	0.75
02130503	Wye River	3					8.21	0.67
02130504	Kent Narrows	3					5.57	0.38
02130505	Lower Chester River	3			5.7	5.0	4.48	0.31
02130506	Langford Creek	4					8.51	0.72
02130507	Corsica River	3					8.63	0.66
02130508	Southeast Creek	3					8.28	0.55
02130509	Middle Chester River	3					9.66	0.62
02130510	Upper Chester River	3			5.7	5.0	8.32	0.54
02130511	Kent Island Bay	3					23.18	0.89
02130601	Lower Elk River	3			7.5	6.8	6.10	0.41
02130602	Bohemia River	2			6.0	7.7	7.67	0.42
02130603	Upper Elk River	2					10.14	0.53
02130604	Back Creek	2			7.5	6.8	10.03	0.71
02130605	Little Elk Creek	0					9.64	0.63
02130606	Big Elk Creek	0					7.29	0.36
02130607	Christina River	0						
02130608	Northeast River	2			5.3	7.3	7.93	0.44
02130609	Furnace Bay	2					7.65	0.51
02130610	Sassafras River	2			4.3	6.7	7.92	0.66
02130611	Stillpond-Fairlee	2					8.25	0.67
02130701	Bush River	2			4.3	7.0	27.88	1.14
02130702	Lower Winters Run	0					11.54	0.38
02130703	Atkisson Reservoir	2					9.18	0.49
02130704	Bynum Run	2					10.94	0.47
02130705	Aberdeen Prov. Grd.	2					9.32	0.32
02130706	Swan Creek	2					15.28	0.67

**Table 2a. - Cont'd.**

MD 8-digit Code	Watershed Name	Number of State 303(d) Impairment	Non-Tidal Total P Index	Non-Tidal Total N Index	Tidal Habitat Index	Tidal Eutroph Index	Modeled Total N Load (lbs/ acre)	Modeled Total P Load (lbs/ acre)
02130801	Gunpowder River	2			6.3	8.0	5.18	0.22
02130802	Lower Gunpd. Falls	2	9.0	8.0			8.05	0.45
02130803	Bird River	2					10.37	0.47
02130804	Little Gunpd. Falls	2					7.20	0.51
02130805	Loch Raven Reservoir	2	10.0	7.0			6.01	0.35
02130806	Prettyboy Reservoir	2	10.0	5.0			5.57	0.40
02130807	Middle River - Browns	2			8.0	9.3	9.57	0.38
02130901	Back River	2			4.0	2.7	10.66	0.58
02130902	Bodkin Creek	3						
02130903	Baltimore Harbor	2			4.0	6.0	137.20	5.62
02130904	Jones Falls	3	10.0	8.0			9.10	0.49
02130905	Gwynns Falls	2	10.0	8.0			9.52	0.52
02130906	Patapsco River L N Br	3	9.0	6.5			9.44	0.36
02130907	Liberty Reservoir	3	10.0	2.0				
02130908	S Branch Patapsco	2					12.95	0.46
02131001	Magothy River	3			6.3	7.0	10.48	0.33
02131002	Severn River	3			7.0	7.3	8.79	0.34
02131003	South River	3			6.3	7.3	14.01	1.13
02131004	West River	3			7.8	7.3	7.93	0.49
02131005	West Ches. Bay	2					7.14	0.47
02131101	Patuxent River lower	2			8.3	7.5	7.25	0.52
02131102	Patuxent River middle	2			8.3	7.5	13.51	1.16
02131103	Western Branch	2			8.3	7.5	9.45	0.60
02131104	Patuxent River upper	2	7.0	7.0			9.13	0.52
02131105	Little Patuxent River	3					14.14	0.69
02131106	Middle Patuxent River	3					6.68	0.33
02131107	Rocky Gorge Dam	1	10.0	8.0			1.94	0.22
02131108	Brighton Dam	2	10.0	6.0			1.82	0.26
02139996	Upper Ches. Bay	0						
02139997	Middle Ches. Bay	0						
02139998	Lower Ches. Bay	0						
02140101	Pot. R. L tidal	2			6.6	7.1	1.63	0.09
02140102	Pot. R. M tidal	3			6.6	7.1	9.54	0.24
02140103	St. Mary's River	3					5.22	0.26
02140104	Breton Bay	3					6.40	0.42
02140105	St. Clements Bay	3					6.96	0.42
02140106	Wicomico River	3					5.96	0.35
02140107	Gilbert Swamp	2					7.30	0.41
02140108	Zekiah Swamp	3					6.87	0.33
02140109	Port Tobacco River	2					7.17	0.33
02140110	Nanjemoy Creek	2					4.38	0.22
02140111	Mattawoman Creek	2			6.6	7.1	6.18	0.32
02140201	Pot. R. U tidal	3			6.6	7.1	28.11	0.39
02140202	Pot. R. MO Cnty	2	8.0	7.8			7.19	0.54
02140203	Piscataway Creek	2	7.0	10.0			7.81	0.38
02140204	Oxon Creek	2					704.90	6.41
02140205	Anacostia River	2	9.0	9.0			9.34	0.53
02140206	Rock Creek	2	9.0	8.0			9.79	0.54
02140207	Cabin John Creek	2	10.0	8.0			8.85	0.63
02140208	Seneca Creek	2	7.0	5.0			8.15	0.77
02140301	Pot. R. FR Cnty	0	8.5	8.0			7.67	0.61
02140302	Lower Monocacy R.	2	4.5	5.0			10.31	1.31
02140303	Upper Monocacy R.	2	7.0	7.0			7.27	0.73
02140304	Double Pipe Creek	2	9.0	4.0			9.16	0.98
02140305	Catoctin Creek	2	8.5	5.5			8.81	0.67



**Table 2a. - Cont'd.**

MD 8-digit Code	Watershed Name	Number of State 303(d) Impairment	Non-Tidal Total P Index	Non-Tidal Total N Index	Tidal Habitat Index	Tidal Eutroph Index	Modeled Total N Load (lbs/ acre)	Modeled Total P Load (lbs/ acre)
02140501	Pot. R. WA Cnty	2	9.0	8.0			6.28	0.60
02140502	Antietam Creek	2	5.3	1.7			12.11	1.24
02140503	Marsh Run	0					7.38	0.80
02140504	Conococheague Cr.	2	7.0	2.0			10.21	0.87
02140505	Little Conococheague	0					5.84	0.63
02140506	Licking Creek	0					3.92	0.17
02140507	Tonoloway Creek	0					10.91	1.49
02140508	Pot. R. AL Cnty	0	9.5	10.0			3.70	0.14
02140509	Little Tonoloway Creek	0					4.24	0.22
02140510	Sideling Hill Creek	0					3.90	0.17
02140511	Fifteen Mile Creek	0					3.52	0.09
02140512	Town Creek	2	10.0	10.0			3.96	0.24
02141001	Pot. R. Low. N Branch	5	8.8	9.5			9.52	1.68
02141002	Evitts Creek	4					3.96	0.32
02141003	Wills Creek	4	10.0	10.0			3.95	0.24
02141004	Georges Creek	3	9.0	9.0			4.29	0.37
02141005	Pot. R. Up. N Branch	4	10.0	10.0			3.37	0.23
02141006	Savage River	4	10.0	10.0			2.94	0.15
05020201	Youghiogheny River	4						
05020202	Little Youghiogheny R	4						
05020203	Deep Creek Lake	2						
05020204	Casselman River	2						

**Table 2b. Category 1 data (living resource indicators).**

(NOTE: Grey-shaded values exceed benchmark or goal. Segments are listed by watershed code)

MD 8-digit Code	Watershed Name	SAV Abundance Index	SAV Habitat Require. Index	Tidal Benthic IBI Index	Tidal Fish IBI Index	Anadromous Fish Index	Non-Tidal Fish IBI Index	Non-Tidal Benthic IBI Index	Non-Tidal Habitat Index
02050301	Conewago Creek								
02120201	L Susquehanna R.								
02120202	Deer Creek						8.1	6.9	7.2
02120203	Octoraro Creek						7.5	7.8	6.9
02120204	Conow. Dam Susq R						8.3		7.8
02120205	Broad Creek						7.9	7.4	6.1
02130101	Atlantic Ocean								
02130102	Assawoman Bay	1.0							
02130103	Isle of Wight Bay	1.0						5.4	
02130104	Sinepuxent Bay								
02130105	Newport Bay	*						3.2	
02130106	Chincoteague Bay								
02130201	Pocomoke Sound	1.0	8.0						
02130202	Lower Pocomoke R.	1.0	2.5					3.6	
02130203	Upper Pocomoke R.						6.0	4.7	4.8
02130204	Dividing Creek								
02130205	Nassawango Creek							3.8	
02130206	Tangier Sound	1.0	8.0						
02130207	Big Annemessex R.	1.0	4.0		8.0	3.00			
02130208	Manokin River	1.0	5.0					4.1	
02130301	Lower Wicomico R.	1.0	2.5						
02130302	Monie Bay	1.0	2.5						
02130303	Wicomico Creek								
02130304	Wicomico R. Head								
02130305	Nanticoke River	1.0	3.0	7.00	8.0	9.50	5.6	6.1	4.9
02130306	Marshyhope Creek						6.7	5.7	5.3
02130307	Fishing Bay	1.0	8.0		2.0	2.00			
02130308	Transquaking River							2.9	

**Table 2b. - Cont'd.**

MD 8-digit	SAV Abundance	SAV Habitat Require.	Tidal Benthic	Tidal Fish	Anadromous	Non-Tidal Fish	Non-Tidal Benthic	Non-Tidal Habitat
02130401	Honga River							
02130402	Little Choptank	1.5	5.0					
02130403	Lower Choptank	1.5	5.0	5.00	7.45		5.3	5.4
02130404	Upper Choptank	1.5	5.0	5.00		6.5	4.9	4.9
02130405	Tuckahoe Creek					8.1	5.5	6.1
02130501	Eastern Bay	2.0	9.0					
02130502	Miles River	2.0	9.0					
02130503	Wye River	2.0	9.0		8.0	8.40	5.7	2.8
02130504	Kent Narrows							
02130505	Lower Chester River	1.0	3.0	7.00	2.0	7.18		
02130506	Langford Creek	1.0	3.0					
02130507	Corsica River	1.0	3.0			7.9	5.8	4.3
02130508	Southeast Creek	1.0	3.0			6.8	4.7	3.1
02130509	Middle Chester River	1.0	3.0				3.6	
02130510	Upper Chester River	1.0	3.0			7.3	6.5	5.4
02130511	Kent Island Bay							
02130601	Lower Elk River	1.0	3.0	4.00				
02130602	Bohemia River	1.0	3.0		2.0	8.25	3.6	
02130603	Upper Elk River	1.0	3.0				4.0	
02130604	Back Creek	1.0	3.0					
02130605	Little Elk Creek							
02130606	Big Elk Creek					8.8		7.1
02130607	Christina River							
02130608	Northeast River	1.0	2.0			8.1	5.5	7.3
02130609	Furnace Bay							
02130610	Sassafras River	1.0	3.0					
02130611	Stillpond-Fairlee							
02130701	Bush River	1.0	2.0					
02130702	Lower Winters Run							
02130703	Atkisson Reservoir					8.5	4.4	6.0
02130704	Bynum Run					8.3		6.0
02130705	Aberdeen Prov. Grd.							
02130706	Swan Creek							
02130801	Gunpowder River	1.0	2.0					
02130802	Lower Gunpd. Falls						4.3	
02130803	Bird River							
02130804	Little Gunpd. Falls					7.5	6.2	5.4
02130805	Loch Raven Reservoir					7.0	7.2	6.0
02130806	Prettyboy Reservoir					8.6	6.3	6.5
02130807	Middle River - Browns	1.0	7.0					
02130901	Back River	1.0	1.0			4.2	2.4	5.2
02130902	Bodkin Creek							
02130903	Baltimore Harbor	1.0	1.0	4.25	3.5	6.00	6.0	4.1
02130904	Jones Falls					5.1	4.6	5.8
02130905	Gwynns Falls					5.8	4.7	6.6
02130906	Patapsco River L N Br					6.4	5.4	5.6
02130907	Liberty Reservoir					8.9	6.9	6.5
02130908	S Branch Patapsco					8.9	6.3	6.7
02131001	Magothy River	1.0	7.0		2.0	4.87		
02131002	Severn River	1.0	6.0		5.0	3.79	5.3	5.7
02131003	South River	1.0	4.0		5.0	4.59	4.6	
02131004	West River	1.0	4.0					
02131005	West Ches. Bay					4.9	4.2	5.1
02131101	Patuxent River lower	1.0	3.3	4.67	5.0	7.59	7.7	5.8
02131102	Patuxent River middle	1.0	3.3				6.5	6.0
02131103	Western Branch	1.0	3.3				7.9	4.2
02131104	Patuxent River upper						5.1	4.2
02131105	Little Patuxent River					5.6	4.6	4.9
02131106	Middle Patuxent River					7.6	7.3	6.4
02131107	Rocky Gorge Dam					7.7	7.1	6.2
02131108	Brighton Dam					7.4	6.9	6.3

**Table 2b. - Cont'd.**

MD 8-digit		SAV Abundance	SAV Habitat Require.	Tidal Benthic	Tidal Fish	Anadromous	Non-Tidal Fish	Non-Tidal Benthic	Non-Tidal Habitat
02139996	Upper Ches. Bay								
02139997	Middle Ches. Bay								
02139998	Lower Ches. Bay								
02140101	Pot. R. L tidal	1.0	3.3	5.67					
02140102	Pot. R. M tidal	1.0	3.3					6.2	
02140103	St. Mary's River	1.0	3.3						
02140104	Breton Bay	1.0	3.3						
02140105	St. Clements Bay	1.0	3.3				6.4	7.4	4.4
02140106	Wicomico River	1.0	3.3		5.0	5.78			
02140107	Gilbert Swamp							4.6	4.3
02140108	Zekiah Swamp						7.6	6.9	5.1
02140109	Port Tobacco River	1.0	3.3					4.7	
02140110	Nanjemoy Creek	1.0	3.3				7.4	6.0	4.5
02140111	Mattawoman Creek	1.0	3.3			8.53	5.5	5.9	4.9
02140201	Pot. R. U tidal	1.0	3.3				6.0		6.9
02140202	Pot. R. MO Cnty						7.8	5.8	5.4
02140203	Piscataway Creek	1.0	3.3				7.8	5.3	5.4
02140204	Oxon Creek	1.0	3.3						
02140205	Anacostia River						6.3	4.6	5.5
02140206	Rock Creek						7.5	5.1	6.1
02140207	Cabin John Creek						5.6		5.7
02140208	Seneca Creek						9.3	5.8	6.4
02140301	Pot. R. FR Cnty						7.3	5.0	5.1
02140302	Lower Monocacy R.						8.2	5.6	6.1
02140303	Upper Monocacy R.						8.3	5.1	6.4
02140304	Double Pipe Creek						7.6	4.7	5.8
02140305	Catoctin Creek							6.3	
02140501	Pot. R. WA Cnty							5.1	3.1
02140502	Antietam Creek						7.8	5.6	5.4
02140503	Marsh Run								
02140504	Conococheague Cr.							6.0	5.9
02140505	Little Conococheague							7.0	
02140506	Licking Creek							6.2	
02140507	Tonoloway Creek								
02140508	Pot. R. AL Cnty							6.9	
02140509	Little Tonoloway Creek							6.7	
02140510	Sideling Hill Creek						6.8	5.6	6.2
02140511	Fifteen Mile Creek						6.6	7.0	5.5
02140512	Town Creek						6.8	6.2	5.3
02141001	Pot. R. Low. N Branch						5.0	6.7	5.9
02141002	Evitts Creek							6.3	
02141003	Wills Creek						4.1	5.9	5.6
02141004	Georges Creek						3.3	3.7	6.0
02141005	Pot. R. Up. N Branch						4.6	5.3	6.1
02141006	Savage River						7.8	7.1	6.9
05020201	Youghiogheny River						6.8	6.8	6.3
05020202	Little Youghiogheny R							7.6	3.8
05020203	Deep Creek Lake						2.8	5.0	
05020204	Casselman River						8.0	7.4	

**Table 2c. Category 1 data (landscape indicators).***(NOTE: Grey-shaded values exceed benchmark or goal. Segments are listed by watershed code)*

MD 8-digit Code	Watershed Name	Impervious Surface (percent)	Population Density (people/acre)	Wetland Loss (acre)	Unbuffered Streams (percent)	Soil Erodibility (value/acre)
02050301	Conewago Creek	2.8	0.50	0	55	0.23
02120201	L Susquehanna R.	11.6	0.44	3273	31	0.27
02120202	Deer Creek	3.4	0.89	4665	52	0.30
02120203	Octoraro Creek	3.6	0.37	1897	34	0.31
02120204	Conow. Dam Susq R	3.5	0.49	895	16	0.27
02120205	Broad Creek	2.8	0.80	694	54	0.12
02130101	Atlantic Ocean	0.1	0.00	0		
02130102	Assawoman Bay	11.6	0.08	3531	61	0.13
02130103	Isle of Wight Bay	6.9	0.11	16129	44	0.23
02130104	Sinepuxent Bay	9.9	0.09	2662	79	0.13
02130105	Newport Bay	3.9	0.13	17025	25	0.08
02130106	Chincoteague Bay	1.0	0.07	28820	26	0.13
02130201	Pocomoke Sound	0.6	0.12	24264	14	0.25
02130202	Lower Pocomoke R.	1.8	0.13	71922	23	0.31
02130203	Upper Pocomoke R.	0.7	0.23	80903	38	0.30
02130204	Dividing Creek	0.1	0.15	34709	24	0.28
02130205	Nassawango Creek	1.0	0.22	34332	24	0.26
02130206	Tangier Sound	1.0	0.02	3517	2	0.04
02130207	Big Annemessex R.	1.0	0.12	15631	28	0.25
02130208	Manokin River	1.7	0.12	43036	31	0.27
02130301	Lower Wicomico R.	8.0	0.33	42358	21	0.29
02130302	Monie Bay	0.6	0.12	13799	10	0.25
02130303	Wicomico Creek	1.4	0.21	16422	31	0.31
02130304	Wicomico R. Head	8.8	0.34	16145	35	0.35
02130305	Nanticoke River	1.2	0.26	54807	21	0.24
02130306	Marshyhope Creek	1.9	0.12	28117	46	0.27
02130307	Fishing Bay	0.8	0.10	56129	8	0.22
02130308	Transquaking River	0.5	0.10	37925	37	0.30
02130401	Honga River	0.8	0.05	10203	5	0.13
02130402	Little Choptank	0.6	0.07	47585	48	0.21
02130403	Lower Choptank	2.8	0.09	56918	56	0.16
02130404	Upper Choptank	2.1	0.16	48169	49	0.28
02130405	Tuckahoe Creek	0.9	0.17	35689	60	0.30
02130501	Eastern Bay	2.4	0.05	11085	67	0.10
02130502	Miles River	4.0	0.15	14026	58	0.27
02130503	Wye River	1.2	0.16	17867	30	0.30
02130504	Kent Narrows	5.0	0.10	4622	55	0.19
02130505	Lower Chester River	1.4	0.07	27593	40	0.17
02130506	Langford Creek	0.9	0.09	16014	54	0.32
02130507	Corsica River	2.3	0.17	4192	37	0.32
02130508	Southeast Creek	0.7	0.18	11412	33	0.31
02130509	Middle Chester River	3.7	0.11	13226	41	0.30
02130510	Upper Chester River	1.0	0.15	36993	41	0.30
02130511	Kent Island Bay	10.9	0.17	4604	78	0.33
02130601	Lower Elk River	2.9	0.29	5218	19	0.04
02130602	Bohemia River	0.7	0.33	3715	15	0.30
02130603	Upper Elk River	9.2	0.34	8606	27	0.32
02130604	Back Creek	4.6	0.35	3320	15	0.29
02130605	Little Elk Creek	6.5	0.37	6577	33	0.34
02130606	Big Elk Creek	4.9	0.37	5350	25	0.10
02130607	Christina River	8.7	0.36	1928	0	0.35
02130608	Northeast River	6.1	0.33	16056	31	0.31
02130609	Furnace Bay	5.2	0.36	2260	32	0.18
02130610	Sassafras River	1.2	0.17	11651	31	0.28
02130611	Stillpond-Fairlee	1.9	0.10	27678	29	0.32

**Table 2c. - Cont'd.**

MD 8-digit Code	Watershed Name	Impervious Surface (percent)	Population Density (people/acre)	Wetland Loss (acre)	Unbuffered Streams (percent)	Soil Erodibility (value/acre)
02130701	Bush River	12.0	0.68	9763	21	0.18
02130702	Lower Winters Run	18.3	0.81	3102	34	0.33
02130703	Atkisson Reservoir	10.2	0.81	1631	43	0.31
02130704	Bynum Run	21.1	0.81	3321	70	0.34
02130705	Aberdeen Prov. Grd.	31.5	0.87	258	26	0.01
02130706	Swan Creek	14.2	0.78	5940	28	0.33
02130801	Gunpowder River	13.7	0.79	3830	19	0.11
02130802	Lower Gunpd. Falls	12.7	1.88	2589	44	0.33
02130803	Bird River	21.9	1.78	6673	37	0.33
02130804	Little Gunpd. Falls	6.1	1.30	2572	40	0.33
02130805	Loch Raven Reservoir	7.5	1.83	2261	48	0.31
02130806	Prettyboy Reservoir	2.8	1.20	892	50	0.29
02130807	Middle River - Browns	24.9	1.37	3298	100	0.25
02130901	Back River	40.6	5.29	7011	68	0.21
02130902	Bodkin Creek	15.2	1.54	358	0	0.20
02130903	Baltimore Harbor	35.1	3.55	7681	61	0.14
02130904	Jones Falls	35.4	5.56	1691	59	0.21
02130905	Gwynns Falls	42.2	5.85	3394	61	0.22
02130906	Patapsco River L N Br	21.9	1.95	8422	33	0.31
02130907	Liberty Reservoir	6.3	0.70	3987	43	0.28
02130908	S Branch Patapsco	6.0	0.79	2745	49	0.12
02131001	Magothy River	20.2	1.42	1255	45	0.19
02131002	Severn River	17.0	1.53	6226	26	0.26
02131003	South River	10.3	1.55	2495	13	0.33
02131004	West River	5.0	1.48	8056	31	0.30
02131005	West Ches. Bay	6.8	0.89	12960	13	0.30
02131101	Patuxent River lower	5.0	0.72	42599	10	0.26
02131102	Patuxent River middle	5.7	2.14	7648	16	0.29
02131103	Western Branch	17.5	2.58	10479	33	0.31
02131104	Patuxent River upper	15.6	2.24	10106	29	0.30
02131105	Little Patuxent River	25.5	1.62	10022	50	0.29
02131106	Middle Patuxent River	9.1	1.51	692	39	0.22
02131107	Rocky Gorge Dam	9.4	2.41	1337	46	0.30
02131108	Brighton Dam	3.9	1.80	3371	45	0.20
02139996	Upper Ches. Bay	0.0	0.00	1	0	0.00
02139997	Middle Ches. Bay	0.3	0.03	3	0	0.00
02139998	Lower Ches. Bay	0.0	0.00	224	0	0.01
02140101	Pot. R. L tidal	1.1	0.10	42383	19	0.08
02140102	Pot. R. M tidal	1.7	0.28	16201	7	0.12
02140103	St. Mary's River	5.3	0.32	26406	17	0.25
02140104	Breton Bay	4.3	0.36	17931	9	0.33
02140105	St. Clements Bay	1.9	0.35	14522	13	0.34
02140106	Wicomico River	2.0	0.35	23879	19	0.29
02140107	Gilbert Swamp	2.5	0.46	14582	19	0.37
02140108	Zekiah Swamp	7.0	0.62	36637	20	0.29
02140109	Port Tobacco River	6.8	0.45	14830	21	0.25
02140110	Nanjemoy Creek	1.8	0.47	36432	8	0.21
02140111	Mattawoman Creek	9.5	1.00	47616	17	0.34
02140201	Pot. R. U tidal	18.7	1.87	10919	38	0.26
02140202	Pot. R. MO Cnty	13.3	2.57	8768	52	0.19
02140203	Piscataway Creek	16.7	2.54	15504	21	0.32
02140204	Oxon Creek	40.9	2.57	3210	62	0.36
02140205	Anacostia River	33.2	2.66	16720	47	0.31
02140206	Rock Creek	33.6	2.74	1804	53	0.31
02140207	Cabin John Creek	36.6	2.75	992	48	0.31
02140208	Seneca Creek	11.9	2.72	7547	54	0.11

**Table 2c. - Cont'd.**

MD 8-digit Code	Watershed Name	Impervious Surface (percent)	Population Density (people/acre)	Wetland Loss (acre)	Unbuffered Streams (percent)	Soil Erodibility (value/acre)
02140301	Pot. R. FR Cnty	3.1	0.44	4508	79	0.27
02140302	Lower Monocacy R.	6.3	0.71	11799	65	0.28
02140303	Upper Monocacy R.	2.2	0.48	15277	61	0.28
02140304	Double Pipe Creek	3.0	0.50	9677	77	0.25
02140305	Catoctin Creek	2.0	0.47	8362	64	0.30
02140501	Pot. R. WA Cnty	2.9	0.41	4297	38	0.26
02140502	Antietam Creek	7.0	0.44	10792	79	0.29
02140503	Marsh Run	8.0	0.44	1660	84	0.29
02140504	Conococheague Cr.	7.4	0.44	6195	84	0.28
02140505	Little Conococheague	2.1	0.44	1106	64	0.30
02140506	Licking Creek	0.3	0.44	1572	23	0.27
02140507	Tonoloway Creek	6.1	0.43	250	19	0.27
02140508	Pot. R. AL Cnty	0.3	0.32	1613	10	0.24
02140509	Little Tonoloway Creek	2.4	0.44	601	31	0.24
02140510	Sideling Hill Creek	0.7	0.34	818	10	0.24
02140511	Fifteen Mile Creek	0.2	0.28	1619	5	0.25
02140512	Town Creek	0.4	0.28	3947	23	0.28
02141001	Pot. R. Low. N Branch	5.1	0.28	9171	25	0.28
02141002	Evitts Creek	6.8	0.28	1774	44	0.29
02141003	Wills Creek	7.5	0.28	3435	34	0.28
02141004	Georges Creek	10.2	0.21	2042	38	0.31
02141005	Pot. R. Up. N Branch	6.2	0.07	2122	20	0.29
02141006	Savage River	1.1	0.07	1017	12	0.27
05020201	Youghiogheny River	1.9	0.07	9789	33	0.28
05020202	Little Youghiogheny R	2.6	0.07	1780	64	0.26
05020203	Deep Creek Lake	4.6	0.07	2497	34	0.26
05020204	Casselman River	2.2	0.07	7594	28	0.30

Other indicators appear useful only in assessing Category 3 watersheds. For example, trout spawning areas are an indicator of relatively pristine natural conditions and is used as a Category 3 indicator. This indicator would not be useful for Category 1 watersheds as the absence of trout spawning areas does not necessarily imply that a stream is degraded - it may never have had the natural conditions that are prerequisite for trout spawning. These indicators can be clustered under key living resource and landscape issues and others address special water use needs (i.e., drinking water and fish hatchery water supply):

- Living Resources
  - \* Instream physical habitat
  - \* Indices of the health of non-tidal and tidal fish communities
  - \* Wetland dependent species
  - \* “Imperiled” (rare, threatened and endangered) aquatic species
  - \* Trout spawning areas
  - \* Migratory fish spawning areas
- Landscape
  - \* Headwater stream systems in interior forest
  - \* Forest density
  - \* Designated State Wildlands
- Drinking water source protection watersheds, and
- Fish hatchery water supply watersheds

Application of these indicators is described in **Appendix III** and results were compared to Category 3 indicators benchmarks that are listed in **Table 3**. Any watershed with two or more indicators meeting these criteria was placed in Category 3. As with Category 1 indicators, the results of Category 3 indicators are provided in the available [watershed profiles](#) ([Maryland Watershed Profiles](#), MD Dept. Natural Resources, 1998 (see example in **Appendix IV**).

**Table 3. Benchmarks/thresholds for Category 3 (Protection) watersheds**

Condition of...	Indicator	Benchmark
<b>Aquatic Living Resources</b>	Tidal Benthic Index of Biotic Integrity	highest 25 %
	Non-Tidal Instream Habitat Index	highest 25 %
	Non-Tidal Fish Index of Biotic Integrity	score > 8 (sample n ≥ 4)
	Imperiled Aquatic Species Indicator	score > 0
	Migratory Fish Spawning Area	score > 0
	Anadromous Fish Index	highest 25 %
	Wetland-Dependent Species	highest 25 %
	Trout Spawning Area	score > 0
<b>Landscape Parameters</b>	Percent Headwater Streams Occurring in Interior Forest	highest 25 %
	Percent Watershed Forested	highest 25 %
	Wildland Acres	presence
<b>Special Water Quality</b>	Fish Hatchery Water Supply	presence
	Number of Drinking Water Intakes	presence

The resulting Category 1 indicator data for each watershed are listed in **Table 4**.

**Table 4a. Category 3 data (living resource indicators).**

(NOTE: Grey-shaded values meet or exceed benchmark or goal. Segments are listed by watershed code)

MD 8-Digit Code	Watershed Name	Tidal Fish IBI	Anadromous Fish Index	Non-Tidal Fish IBI	Non-Tidal Habitat Index	Wetland Dependent Species	Trout Spawn Area	Migratory Fish Spawning Area	Imperiled Aquatic Species
02050301	Conewago Creek					59.8	0		0
02120201	L Susquehanna R					36.0	5	7	9
02120202	Deer Creek			8.13	7.15	0.0	9	3	0
02120203	Octoraro Creek			7.50	6.90	56.1	5	2	0
02120204	Conowingo Dam			8.25	7.77	8.5	0	0	9
02120205	Broad Creek			7.88	6.13	0.0	5	0	9
02130101	Atlantic Ocean					0.0			
02130102	Assawoman Bay					60.9		0	
02130103	Isle of Wight Bay					53.7		0	0
02130104	Sinepuxent Bay					52.2		0	
02130105	Newport Bay					62.3		1	0
02130106	Chincoteague Bay					58.7		1	9
02130201	Pocomoke Sound					63.1		1	0
02130202	Lower Pocomoke R					56.0		4	9
02130203	Upper Pocomoke R			6.02	4.80	55.1		0	10
02130204	Dividing Creek					55.2		0	0
02130205	Nassawango Creek					55.2		0	9
02130206	Tangier Sound					57.9		0	
02130207	Big Annemessex R	8.00	3.00			59.1		1	
02130208	Manokin River					60.9		2	6

Table 4a - cont.

MD 8-Digit Code	Watershed Name	Tidal Fish IBI	Anadromous Fish Index	Non-Tidal Fish IBI	Non-Tidal Habitat Index	Wetland Dependent Species	Trout Spawn Area	Migratory Fish Spawning Area	Imperiled Aquatic Species
02130301	Lower Wicomico R					60.5		5	0
02130302	Monie Bay					62.8		1	
02130303	Wicomico Creek					55.7		4	9
02130304	Wicomico River Head					55.9		0	0
02130305	Nanticoke River	8.00	9.50	5.63	4.91	61.4		6	9
02130306	Marshyhope Creek			6.70	5.27	55.5		6	10
02130307	Fishing Bay	2.00	2.00			61.5		3	0
02130308	Transquaking River					60.6		3	9
02130401	Honga River					59.3		1	
02130402	Little Choptank					54.9		0	
02130403	Lower Choptank	5.00	7.45		5.36	41.7		5	0
02130404	Upper Choptank			6.50	4.94	56.4		6	7
02130405	Tuckahoe Creek			8.14	6.10	55.3		6	10
02130501	Eastern Bay					17.3		0	
02130502	Miles River					49.7		1	0
02130503	Wye River	8.00	8.40		2.84	50.3		1	6
02130504	Kent Narrows					38.5		0	
02130505	Lower Chester R	2.00	7.18			52.5		4	0
02130506	Langford Creek					55.9		2	8
02130507	Corsica River			7.92	4.31	55.6		2	0
02130508	Southeast Creek			6.80	3.13	56.1		4	7
02130509	Middle Chester R					58.6		5	6
02130510	Upper Chester R			7.26	5.38	54.3		5	9
02130511	Kent Island Bay					60.7		0	
02130601	Lower Elk River					56.6		6	
02130602	Bohemia River	2.00	8.25			57.9		6	0
02130603	Upper Elk River					42.1		6	0
02130604	Back Creek					57.6		6	0
02130605	Little Elk Creek					61.2	0	0	0
02130606	Big Elk Creek			8.83	7.05	58.4	0	0	0
02130607	Christina River					55.3	5	0	0
02130608	Northeast River			8.08	7.30	56.0	0	7	9
02130609	Furnace Bay					56.8	0	7	0
02130610	Sassafras River					53.6		6	0
02130611	Stillpond-Fairlee					55.3		4	0
02130701	Bush River					0.0	0	3	0
02130702	Lower Winters Run					0.0	0	2	6
02130703	Atkisson Reservoir			8.50	5.98	0.0	0	0	6
02130704	Bynum Run			8.30	6.01	0.0	0	0	0
02130705	Aberdeen Proving Grnd					0.0		4	0
02130706	Swan Creek					0.0	0	7	0
02130801	Gunpowder River					0.0	7	3	
02130802	Lower Gunpowder Falls					0.0	0	0	0
02130803	Bird River					0.0	0	3	
02130804	Little Gunpowder Falls			7.50	5.38	0.0	9	0	0
02130805	Loch Raven Reservoir			7.03	5.98	0.0	9	0	0
02130806	Prettyboy Reservoir			8.57	6.50	21.8	8		0
02130807	Middle River/Browns Ck					0.0		1	
02130901	Back River			4.21	5.24	3.4	0	1	0
02130902	Bodkin Creek					55.8		0	0
02130903	Baltimore Harbor	3.50	6.00	6.03	4.40	28.2	0	3	0
02130904	Jones Falls			5.06	5.76	0.6	9	0	0
02130905	Gwynns Falls			5.79	6.59	0.6	5	0	6
02130906	Patapsco R			6.36	5.57	38.0	0	2	6
02130907	Liberty Reservoir			8.87	6.47	37.6	8		0
02130908	S Branch Patapsco			8.94	6.74	56.6	5		6



**Table 4a - cont.**

MD 8-Digit Code	Watershed Name	Tidal Fish IBI	Anadromous Fish Index	Non-Tidal Fish IBI	Non-Tidal Habitat Index	Wetland Dependent Species	Trout Spawn Area	Migratory Fish Spawning Area	Imperiled Aquatic Species
02131001	Magothy River	2.00	4.87			50.0		1	6
02131002	Severn River	5.00	3.79	5.27	6.06	54.4	8	2	0
02131003	South River	5.00	4.59			56.2		3	0
02131004	West River					58.5		3	0
02131005	West Chesapeake Bay			4.88	5.13	40.4		0	0
02131101	Patuxent River lower	5.00	7.59	7.69	4.41	58.0		6	8
02131102	Patuxent River middle			6.50	4.49	59.3		6	6
02131103	Western Branch			7.88	4.25	55.8		0	10
02131104	Patuxent River upper				4.21	54.5	0	0	9
02131105	Little Patuxent River			5.59	4.87	55.0	0	0	9
02131106	Middle Patuxent River			7.60	6.36	55.2	0	0	0
02131107	Rocky Gorge Dam			7.67	6.19	56.4	0	0	6
02131108	Brighton Dam			7.38	6.25	52.8	5	0	0
02139996	Upper Chesapeake Bay					0.0		7	
02139997	Mid-Chesapeake Bay					0.0		0	
02139998	Lower Chesapeake Bay					43.9		0	
02140101	Potomac R Lower tidal					39.1		4	
02140102	Potomac R Middle tidal					57.4		6	
02140103	St. Mary's River					57.0		1	0
02140104	Breton Bay					56.3		2	0
02140105	St. Clement Bay			6.40	4.44	56.2		2	0
02140106	Wicomico River	5.00	5.78			60.9		3	0
02140107	Gilbert Swamp				4.34	57.4		0	6
02140108	Zekiah Swamp			7.60	5.07	55.4		0	9
02140109	Port Tobacco River					57.2		4	6
02140110	Nanjemoy Creek			7.40	4.46	59.1		4	9
02140111	Mattawoman Creek		8.53	5.50	4.93	55.5		5	6
02140201	Potomac R Upper tidal			6.00	6.93	57.1		6	0
02140202	Potomac R MO Cnty			7.81	5.39	51.2	0	1	0
02140203	Piscataway Creek			7.75	5.36	55.2		6	8
02140204	Oxon Creek					37.3		6	0
02140205	Anacostia River			6.25	5.51	53.6	5	4	7
02140206	Rock Creek			7.50	6.10	56.1	0	4	6
02140207	Cabin John Creek			5.63	5.73	55.3	0	0	0
02140208	Seneca Creek			9.27	6.41	57.2	0	0	6
02140301	Potomac R FR Cnty			7.30	5.14	55.4	0		0
02140302	Lower Monocacy R			8.24	6.10	52.4	9		8
02140303	Upper Monocacy R			8.31	6.43	54.1	9		7
02140304	Double Pipe Creek			7.61	5.77	60.1	0		6
02140305	Catoctin Creek					58.0	5		0
02140501	Potomac R WA Cnty				3.14	54.9	0		6
02140502	Antietam Creek			7.77	5.35	59.4	10		8
02140503	Marsh Run					63.4	0		6
02140504	Conococheague Ck				5.93	60.1	0		0
02140505	Little Conococheague					60.2	0		6
02140506	Licking Creek					55.6	5		0
02140507	Tonoloway Creek					57.5	0		6
02140508	Potomac R AL Cnty					46.9	0		0
02140509	Little Tonoloway Ck					56.4	0		0
02140510	Sideling Hill Creek			6.80	6.20	52.3	0		7
02140511	Fifteen Mile Creek			6.58	5.51	56.7	0		6
02140512	Town Creek			6.75	5.30	57.9	0		6
02141001	Potomac R Lower N Br			5.04	5.87	55.1	10		7
02141002	Evitts Creek					54.7	6		6
02141003	Wills Creek			4.13	5.58	54.2	8		0
02141004	Georges Creek			3.33	5.97	56.6	0		6
02141005	Potomac R Upper N Br			4.56	6.14	55.3	8		0
02141006	Savage River			7.76	6.86	55.2	9		6
05020201	Youghiogheny River			6.82	6.33	56.9	8		8
05020202	Little Youghiogheny R				3.84	56.8	8		0
05020203	Deep Creek Lake			2.80	4.26	56.5	8		6
05020204	Casselman River			7.96	6.59	54.2	8		10

**Table 4b. Category 3 data (landscape indicators).***(NOTE: Grey-shaded values meet or exceed benchmark or goal. Segments are listed by watershed code)*

MD 8-Digit Code	Watershed Name	Head-water streams in Forest	Forest Density (fraction)	State Wildland (acres)	Number Drinking Water Intakes	Fish Hatchery Water Source
02050301	Conewago Creek	0.13	0.31	0	0	
02120201	L Susquehanna R	0.07	0.43	0	5	
02120202	Deer Creek	0.12	0.32	0	1	
02120203	Octoraro Creek	0.05	0.32	0	0	
02120204	Conowingo Dam	0.18	0.52	0	3	
02120205	Broad Creek	0.12	0.35	0	0	
02130101	Atlantic Ocean	0.02	0.00	0	0	
02130102	Assawoman Bay	0.07	0.19	0	0	
02130103	Isle of Wight Bay	0.04	0.37	0	0	
02130104	Sinepuxent Bay	0.10	0.31	0	0	
02130105	Newport Bay	0.15	0.42	0	0	
02130106	Chincoteague Bay	0.03	0.41	0	0	
02130201	Pocomoke Sound	0.20	0.44	0	0	
02130202	Lower Pocomoke R	0.20	0.58	3912	0	
02130203	Upper Pocomoke R	0.35	0.53	8	0	
02130204	Dividing Creek	0.32	0.78	0	0	
02130205	Nassawango Creek	0.00	0.72	0	0	
02130206	Tangier Sound	0.02	0.08	2723	0	
02130207	Big Annemessex R	0.16	0.43	0	0	
02130208	Manokin River	0.04	0.46	0	0	
02130301	Lower Wicomico R	0.09	0.39	0	0	
02130302	Monie Bay	0.22	0.46	0	0	
02130303	Wicomico Creek	0.11	0.55	0	0	
02130304	Wicomico River Head	0.11	0.42	0	0	
02130305	Nanticoke River	0.07	0.43	0	0	
02130306	Marshyhope Creek	0.06	0.38	648	0	
02130307	Fishing Bay	0.03	0.41	0	0	
02130308	Transquaking River	0.02	0.36	0	0	
02130401	Honga River	0.16	0.34	0	0	
02130402	Little Choptank	0.02	0.50	0	0	
02130403	Lower Choptank	0.03	0.26	0	0	
02130404	Upper Choptank	0.03	0.31	0	0	
02130405	Tuckahoe Creek	0.01	0.27	0	0	
02130501	Eastern Bay	0.04	0.21	0	0	
02130502	Miles River	0.04	0.30	0	0	
02130503	Wye River	0.00	0.26	0	0	
02130504	Kent Narrows	0.02	0.28	0	0	
02130505	Lower Chester R	0.03	0.29	0	0	
02130506	Langford Creek	0.05	0.26	0	0	
02130507	Corsica River	0.02	0.28	0	0	
02130508	Southeast Creek	0.01	0.30	0	0	
02130509	Middle Chester R	0.05	0.12	0	0	
02130510	Upper Chester R	0.00	0.32	0	0	
02130511	Kent Island Bay	0.24	0.17	0	0	
02130601	Lower Elk River	0.03	0.46	0	0	
02130602	Bohemia River	0.26	0.24	0	0	
02130603	Upper Elk River	0.05	0.54	0	1	
02130604	Back Creek	0.08	0.38	0	0	
02130605	Little Elk Creek	0.20	0.34	0	0	
02130606	Big Elk Creek	0.02	0.40	0	0	
02130607	Christina River	0.21	0.22	0	0	
02130608	Northeast River	0.26	0.45	0	2	
02130609	Furnace Bay	0.06	0.44	0	0	
02130610	Sassafras River	0.05	0.26	0	0	
02130611	Stillpond-Fairlee	0.13	0.30	0	0	
02130701	Bush River	0.08	0.48	0	0	
02130702	Lower Winters Run	0.09	0.39	0	1	
02130703	Atkisson Reservoir	0.01	0.29	0	1	
02130704	Bynum Run	0.18	0.14	0	0	
02130705	Aberdeen Proving Grnd	0.08	0.43	0	0	
02130706	Swan Creek	0.05	0.35	0	0	

**Table 4b - cont.**

MD 8-Digit Code	Watershed Name	Head-water streams in Forest	Forest Density (fraction)	State Wildland (acres)	Number Drinking Water Intakes	Fish Hatchery Water Source
02130801	Gunpowder River	0.15	0.41	0	0	
02130802	Lower Gunpowder Falls	0.04	0.34	967	1	
02130803	Bird River	0.12	0.38	0	0	
02130804	Little Gunpowder Falls	0.16	0.34	813	0	
02130805	Loch Raven Reservoir	0.10	0.38	2799	0	
02130806	Prettyboy Reservoir	0.00	0.37	48	0	
02130807	Middle River/Browns Ck	0.01	0.29	0	0	
02130901	Back River	0.07	0.18	2	0	
02130902	Bodkin Creek	0.00	0.52	0	0	
02130903	Baltimore Harbor	0.04	0.20	542	0	
02130904	Jones Falls	0.02	0.19	0	0	
02130905	Gwynns Falls	0.13	0.18	611	0	
02130906	Patapsco R	0.04	0.43	0	0	
02130907	Liberty Reservoir	0.03	0.33	1532	4	
02130908	S Branch Patapsco	0.01	0.31	0	0	
02131001	Magothy River	0.19	0.33	0	0	
02131002	Severn River	0.37	0.41	0	0	
02131003	South River	0.14	0.51	0	0	
02131004	West River	0.47	0.45	0	0	
02131005	West Chesapeake Bay	0.34	0.62	0	0	
02131101	Patuxent River lower	0.13	0.57	0	0	
02131102	Patuxent River middle	0.08	0.47	0	0	
02131103	Western Branch	0.12	0.39	602	0	
02131104	Patuxent River upper	0.09	0.46	0	0	
02131105	Little Patuxent River	0.11	0.37	0	1	
02131106	Middle Patuxent River	0.12	0.33	0	0	
02131107	Rocky Gorge Dam	0.05	0.37	0	1	
02131108	Brighton Dam	0.00	0.32	1048	0	
02139996	Upper Chesapeake Bay	0.00	0.51	0	0	
02139997	Mid-Chesapeake Bay	0.00	0.21	20	0	
02139998	Lower Chesapeake Bay	0.28	0.01	0	0	
02140101	Potomac R Lower tidal	0.42	0.53	0	0	
02140102	Potomac R Middle tidal	0.36	0.79	0	0	
02140103	St. Mary's River	0.35	0.61	1459	0	
02140104	Breton Bay	0.27	0.61	0	0	
02140105	St. Clement Bay	0.24	0.51	0	0	
02140106	Wicomico River	0.29	0.51	0	0	
02140107	Gilbert Swamp	0.32	0.58	0	0	
02140108	Zekiah Swamp	0.29	0.60	0	0	
02140109	Port Tobacco River	0.49	0.59	0	0	
02140110	Nanjemoy Creek	0.34	0.74	0	0	
02140111	Mattawoman Creek	0.12	0.62	1660	0	
02140201	Potomac R Upper tidal	0.08	0.40	0	0	
02140202	Potomac R MO Cnty	0.22	0.30	453	2	
02140203	Piscataway Creek	0.06	0.48	0	0	
02140204	Oxon Creek	0.04	0.24	0	0	
02140205	Anacostia River	0.03	0.27	0	0	
02140206	Rock Creek	0.02	0.17	0	0	
02140207	Cabin John Creek	0.06	0.16	0	0	
02140208	Seneca Creek	0.00	0.29	0	0	
02140301	Potomac R FR Cnty	0.07	0.34	0	1	
02140302	Lower Monocacy R	0.19	0.26	0	5	
02140303	Upper Monocacy R	0.02	0.36	3489	4	1
02140304	Double Pipe Creek	0.12	0.17	0	0	
02140305	Catoctin Creek	0.20	0.32	0	1	

**Table 4b - cont.**

MD 8-Digit Code	Watershed Name	Head-water streams in Forest	Forest Density (fraction)	State Wildland (acres)	Number Drinking Water Intakes	Fish Hatchery Water Source
02140501	Potomac R WA Cnty	0.09	0.49	0	2	
02140502	Antietam Creek	0.00	0.26	0	0	1
02140503	Marsh Run	0.03	0.14	0	0	
02140504	Conococheague Ck	0.27	0.17	0	0	1
02140505	Little Conococheague	0.48	0.38	0	0	
02140506	Licking Creek	0.45	0.77	0	0	
02140507	Tonoloway Creek	0.63	0.67	0	0	
02140508	Potomac R AL Cnty	0.26	0.88	2217	0	
02140509	Little Tonoloway Ck	0.48	0.63	0	0	
02140510	Sideling Hill Creek	0.78	0.79	964	0	
02140511	Fifteen Mile Creek	0.57	0.94	1326	0	
02140512	Town Creek	0.53	0.80	2766	0	2
02141001	Potomac R Lower N Br	0.23	0.77	0	1	
02141002	Evitts Creek	0.54	0.70	930	1	
02141003	Wills Creek	0.53	0.74	0	0	
02141004	Georges Creek	0.52	0.70	272	6	
02141005	Potomac R Upper N Br	0.63	0.75	0	4	
02141006	Savage River	0.38	0.83	3932	1	
05020201	Youghiogheny River	0.20	0.64	0	2	1
05020202	Little Youghiogheny R	0.31	0.54	0	1	
05020203	Deep Creek Lake	0.35	0.61	0	0	
05020204	Casselman River		0.68	0	1	

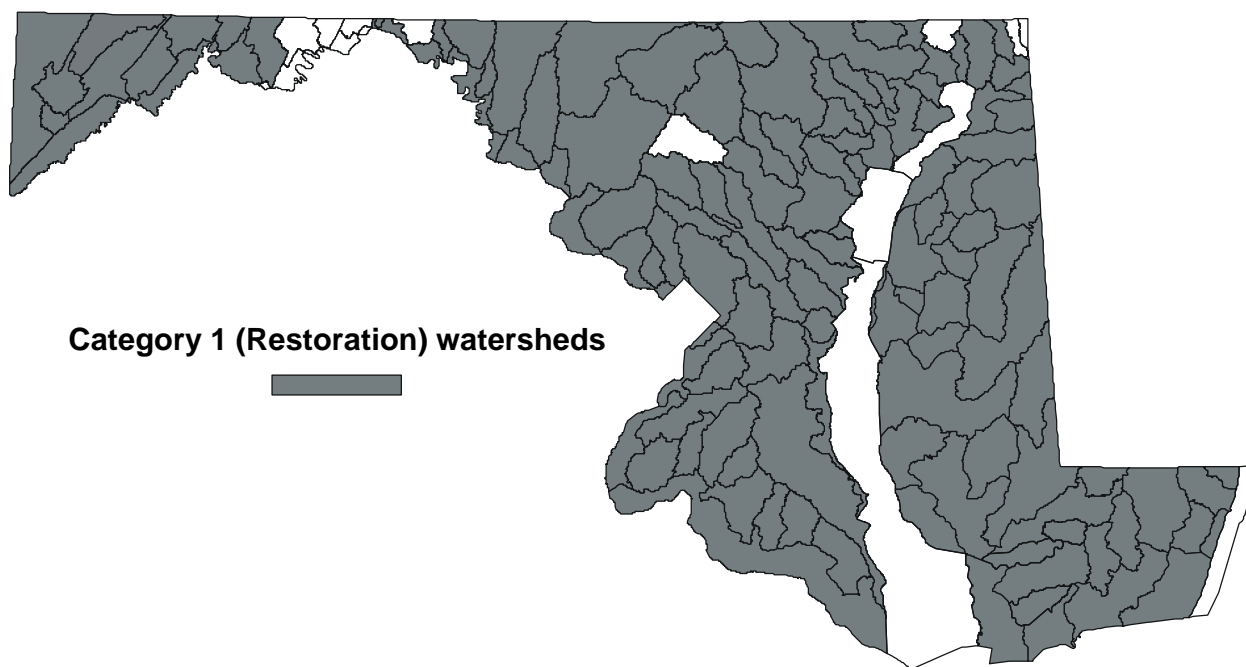
#### Category 4 Watersheds (Insufficient Data)

The federal Clean Water Action Plan created another classification for watershed that do not have enough data to classify the watershed into Categories 1, 2 or 3; these are Category 4 - Insufficient Data. Although the data available for different watersheds varies, the Workgroup determined that there was sufficient data to classify all State watersheds as Category 1, 2 or 3.

#### Results - State Watershed Level

The assessment results are summarized below. Category 1 (Restoration) watersheds are shown in **Figure 3** and listed in **Table 5**. Watersheds with, at most, one indicator exceeding goals and not being identified on the State's 303(d) list, were identified as Category 2 (Preventative Action) watersheds (clear areas in **Figure 3**). Category 3 (Protection) watersheds are listed in **Table 6** and shown in **Figure 4**. Watersheds with four or more indicators meeting Category 3 goals were listed as "Selected Category 3 Watersheds" (**Table 6** and shown in **Figure 5**). All watersheds had sufficient data to allocate them to Category 1, 2 or 3 - thus, there are no Category 4 watersheds.

Because the selection criteria used for Category 1 (Restoration) and Category 3 (Preservation) watersheds are not the same and because land use and related factors may vary considerably within such a large watershed, many of the State's watersheds are identified as both Category 1 and 3 watersheds. These watersheds show signs of stress or degradation but still contain pristine or sensitive natural resources. For example, a watershed may have undisturbed headwaters but be significantly developed at its mouth. Unless watersheds are assessed at a scale where the land use is relatively homogeneous, Category 1 and Category 3 classifications are not mutually exclusive.



**Figure 3.**

Members of the Technical Workgroup and others observing the process suggested that some watersheds with special characteristics should be considered for listing as Protection watersheds in addition to those identified using the selected indicators. After publication of the August 1998 draft report, the following was added to the Category 3 watershed list:

- **Seneca Creek** - Data submitted by Montgomery County as well as State data indicates that Seneca Creek has exceptionally pristine headwater streams

Additional comments received in public hearings held around the State in September 1998 to discuss the Plan, and comments received in writing or at other public forums where the Clean Water Action Plan was discussed were considered by the Technical Workgroup. Several additional watersheds with special characteristics in need of protection were added to the Selected Category 3 list after the October 1, 1998 draft report was produced:

- **Chincoteague Bay** - This waterbody is part of the Coastal Bays National Estuary Program, a boundary area of the National Wildlife Refuge that remains relatively pristine and undisturbed, and;
- **Zekiah Swamp** - Designated as a State Scenic River, this watershed has unique ecological characteristics and remains relatively undisturbed, but adjacent to an urbanizing area.

**Table 5. Category 1 (Restoration) watersheds** (NOTE: segments are ordered by watershed code)

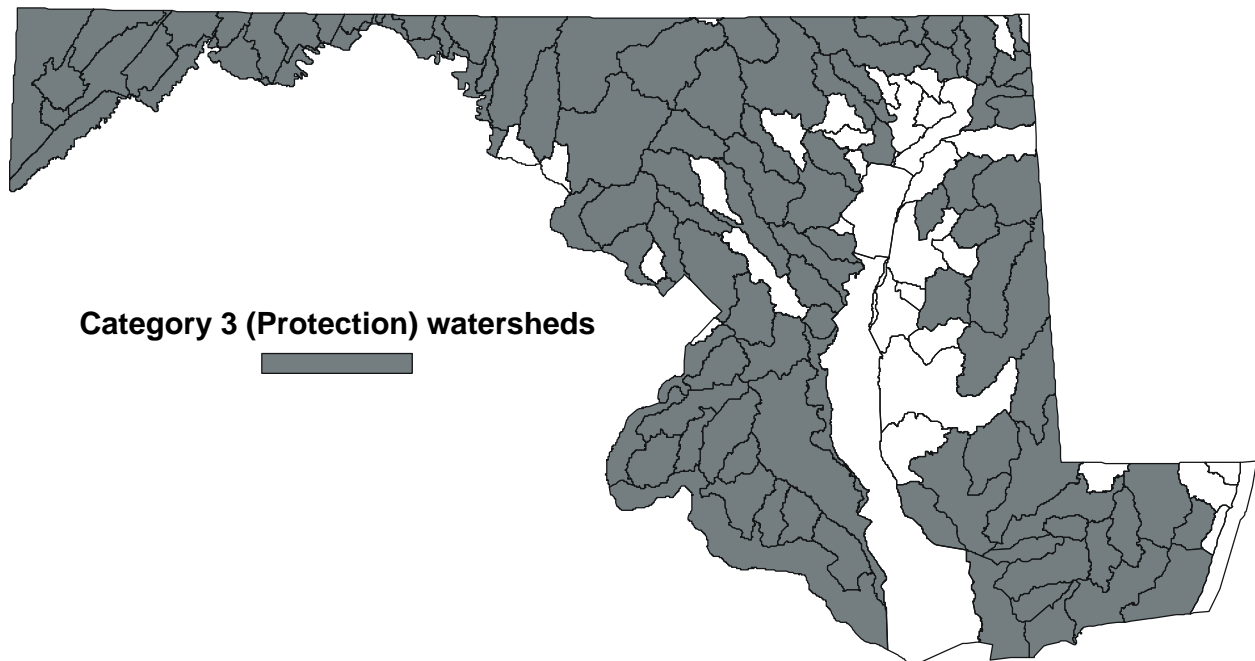
MD 8-digit Code	Watershed Name	MD 8-digit Code	Watershed Name
02050301	Conewago Creek	02130807	Middle River - Browns Creek
02120201	Lower Susquehanna River	02130901	Back River
02120202	Deer Creek	02130902	Bodkin Creek
02120204	Conowingo Dam-Susq. Run	02130903	Baltimore Harbor
02120205	Broad Creek	02130904	Jones Falls
02130102	Assawoman Bay	02130905	Gwynns Falls
02130103	Isle of Wight Bay	02130906	Patapsco River
02130104	Sinepuxent Bay	02130907	Liberty Reservoir
02130105	Newport Bay	02131001	Magothy River
02130106	Chincoteague Bay	02131002	Severn River
02130201	Pocomoke Sound	02131003	South River
02130202	Lower Pocomoke River	02131004	West River
02130203	Upper Pocomoke River	02131005	West Chesapeake Bay
02130204	Dividing Creek	02131101	Lower Patuxent River - tidal
02130205	Nassawango Creek	02131102	Middle Patuxent River - tidal
02130206	Tangier Sound	02131103	Western Branch
02130207	Big Annemessex River	02131104	Patuxent River upper
02130208	Manokin River	02131105	Little Patuxent River
02130301	Lower Wicomico River	02131106	Middle Patuxent River
02130302	Monie Bay	02131107	Rocky Gorge Dam
02130303	Wicomico Creek	02131108	Brighton Dam
02130304	Wicomico River Headwaters	02140101	Lower Potomac River -tidal
02130305	Nanticoke River	02140102	Middle Potomac River - tidal
02130306	Marshyhope Creek	02140103	St. Mary's River
02130307	Fishing Bay	02140104	Breton Bay
02130308	Transquaking River	02140105	St. Clement Bay
02130401	Honga River	02140106	Wicomico River
02130402	Little Choptank	02140107	Gilbert Swamp
02130403	Lower Choptank	02140108	Zekiah Swamp
02130404	Upper Choptank	02140109	Port Tobacco River
02130405	Tuckahoe Creek	02140110	Nanjemoy Creek
02130501	Eastern Bay	02140111	Mattawoman Creek
02130502	Miles River	02140201	Upper Potomac River - tidal
02130503	Wye River	02140202	Potomac River MO County
02130504	Kent Narrows	02140203	Piscataway Creek
02130505	Lower Chester River	02140204	Oxon Creek
02130506	Langford Creek	02140205	Anacostia River
02130507	Corsica River	02140206	Rock Creek
02130508	Southeast Creek	02140207	Cabin John Creek
02130509	Middle Chester River	02140208	Seneca Creek
02130510	Upper Chester River	02140301	Potomac River FR County
02130511	Kent Island Bay	02140302	Lower Monocacy River
02130601	Lower Elk River	02140303	Upper Monocacy River
02130602	Bohemia River	02140304	Double Pipe Creek
02130603	Upper Elk River	02140305	Catoctin Creek
02130604	Back Creek	02140501	Potomac River WA County
02130605	Little Elk Creek	02140502	Antietam Creek
02130608	Northeast River	02140503	Marsh Run
02130609	Furnace Bay	02140504	Conococheague Creek
02130610	Sassafras River	02140505	Little Conococheague
02130611	Stillpond-Fairlee	02140507	Tonoloway Creek
02130701	Bush River	02140512	Town Creek
02130702	Lower Winters Run	02141001	Potomac River Lower N Branch
02130703	Atkisson Reservoir	02141002	Evitts Creek
02130704	Bynum Run	02141003	Wills Creek
02130705	Aberdeen Proving Ground	02141004	Georges Creek
02130706	Swan Creek	02141005	Potomac River U N Branch
02130801	Gunpowder River	02141006	Savage River
02130802	Lower Gunpowder Falls	05020201	Youghiogheny River
02130803	Bird River	05020202	Little Youghiogheny R
02130804	Little Gunpowder Falls	05020203	Deep Creek Lake
02130805	Loch Raven Reservoir	05020204	Casselman River
02130806	Prettyboy Reservoir	--	--

Members of the Technical Workgroup and some public comments received on the draft report suggested that watersheds that serve as part of significant public drinking water supplies also should be considered for restoration and protection. A committee of selected representatives of State and local government agencies examined these issues and recommended to the Workgroup that several watersheds be added to the Category 1 and 3 lists. The Workgroup reviewed this list and added one watershed to the Category 1 (Restoration) list:

- **Brighton Dam (Triadelphia Reservoir)** - This reservoir supplies water through Washington Suburban Sanitary Commission system to the Maryland suburban area of Washington, DC. The watershed is included in the recent Patuxent River Reservoir protection agreement.

The Technical Workgroup also listed three other water supply watersheds as Selected Category 3 (Protection) watersheds:

- **Loch Raven Reservoir** - This reservoir provides water to Baltimore City and to some of the surrounding suburban areas. The reservoir is included in the Reservoir Protection Agreement designed to protect and restore water quality for this significant drinking water source.
- **Rocky Gorge Dam (Duckett Reservoir)**- This reservoir provides water through the Washington Suburban Sanitary Commission to the Maryland suburban area of Washington, DC. The watershed is included in the Patuxent River Reservoir protection agreement.
- **Brighton Dam (Triadelphia Reservoir)** - This reservoir is part of the Washington Suburban Sanitary Commission water supply system on the Patuxent River (see description above).



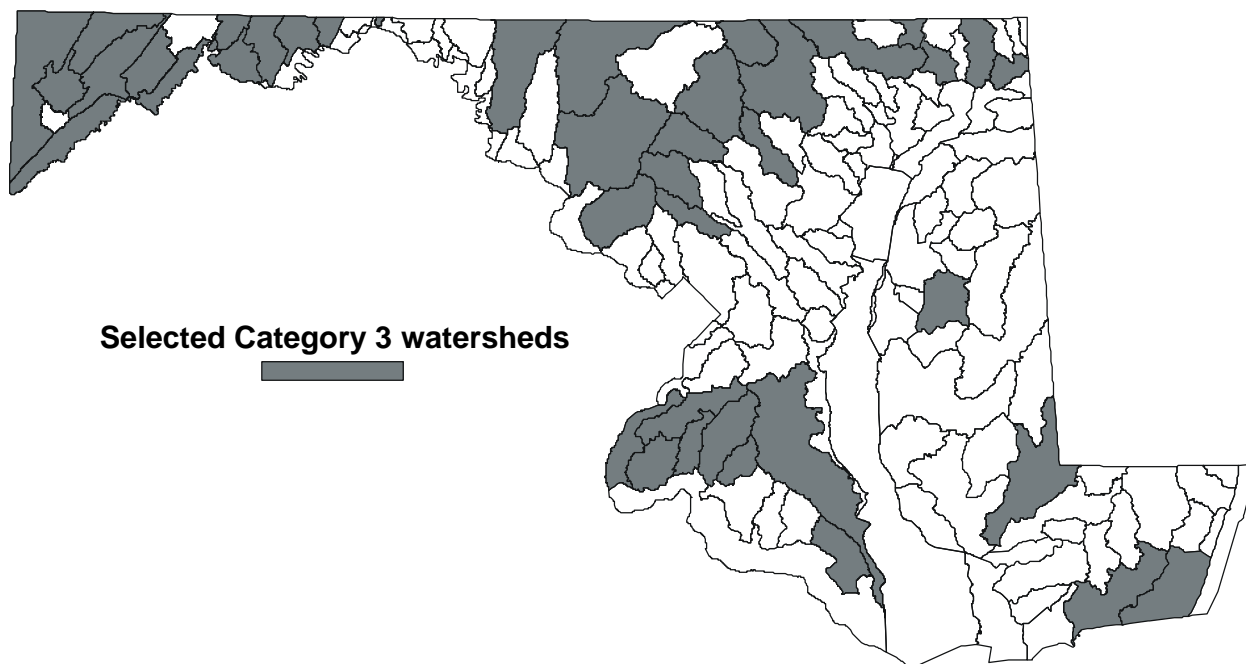
**Figure 4.**

**Table 6. Category 3 (Protection) watersheds.**

(NOTE: Highlighted watersheds are "Selected Category 3" watersheds. Elements are ordered by watershed code)

MD 8-Digit Code	Watershed Name	MD 8-Digit Code	Watershed Name
<b>02120201</b>	<b>Lower Susquehanna River</b>	02131003	South River
<b>02120202</b>	<b>Deer Creek</b>	02131004	West River
02120203	Octoraro Creek	02131005	West Chesapeake Bay
<b>02120204</b>	<b>Conowingo Dam Susq Run</b>	<b>02131101</b>	<b>Patuxent River Lower tidal</b>
02120205	Broad Creek	02131102	Patuxent River Middle tidal
02130105	Newport Bay	02131103	Western Branch
<b>02130106</b>	<b>Chincoteague Bay</b>	02131105	Little Patuxent River
02130201	Pocomoke Sound	<b>02131107</b>	<b>Rocky Gorge Dam</b>
<b>02130202</b>	<b>Lower Pocomoke River</b>	<b>02131108</b>	<b>Brighton Dam</b>
02130203	Upper Pocomoke River	02140101	Potomac River Lower tidal
02130204	Dividing Creek	<b>02140102</b>	<b>Potomac River Middle tidal</b>
02130205	Nassawango Creek	<b>02140103</b>	<b>St. Mary's River</b>
02130206	Tangier Sound	02140104	Breton Bay
02130207	Big Annemessex River	02140105	St. Clements Bay
02130208	Manokin River	02140106	Wicomico River
02130301	Lower Wicomico River	<b>02140107</b>	<b>Gilbert Swamp</b>
02130302	Monie Bay	<b>02140108</b>	<b>Zekiah Swamp</b>
02130303	Wicomico Creek	<b>02140109</b>	<b>Port Tobacco River</b>
<b>02130305</b>	<b>Nanticoke River</b>	<b>02140110</b>	<b>Nanjemoy Creek</b>
02130306	Marshyhope Creek	<b>02140111</b>	<b>Mattawoman Creek</b>
02130307	Fishing Bay	02140201	Potomac River Upper tidal
02130308	Transquaking River	02140202	Potomac River MO County
02130401	Honga River	02140203	Piscataway Creek
02130404	Upper Choptank	02140205	Anacostia River
02130405	Tuckahoe Creek	02140206	Rock Creek
<b>02130503</b>	<b>Wye River</b>	<b>02140208</b>	<b>Seneca Creek</b>
02130506	Langford Creek	<b>02140302</b>	<b>Lower Monocacy River</b>
02130508	Southeast Creek	<b>02140303</b>	<b>Upper Monocacy River</b>
02130509	Middle Chester River	02140304	Double Pipe Creek
02130510	Upper Chester River	02140305	Catoctin Creek
02130601	Lower Elk River	02140501	Potomac River WA County
02130602	Bohemia River	<b>02140502</b>	<b>Antietam Creek</b>
<b>02130603</b>	<b>Upper Elk River</b>	02140503	Marsh Run
02130604	Back Creek	02140504	Conococheague Creek
02130606	Big Elk Creek	02140505	Little Conococheague
<b>02130608</b>	<b>Northeast River</b>	02140506	Licking Creek
02130609	Furnace Bay	<b>02140507</b>	<b>Tonoloway Creek</b>
02130702	Lower Winters Run	02140508	Potomac River AL County
02130703	Atkisson Reservoir	02140509	Little Tonoloway Creek
02130801	Gunpowder River	<b>02140510</b>	<b>Sideling Hill Creek</b>
02130802	Lower Gunpowder Falls	<b>02140511</b>	<b>Fifteen Mile Creek</b>
02130804	Little Gunpowder Falls	<b>02140512</b>	<b>Town Creek</b>
<b>02130805</b>	<b>Loch Raven Reservoir</b>	<b>02141001</b>	<b>Potomac River Lower N Br.</b>
<b>02130806</b>	<b>Prettyboy Reservoir</b>	<b>02141002</b>	<b>Evitts Creek</b>
02130901	Back River	02141003	Wills Creek
02130903	Baltimore Harbor	<b>02141004</b>	<b>Georges Creek</b>
<b>02130905</b>	<b>Gwynns Falls</b>	<b>02141005</b>	<b>Potomac River Upper N Br.</b>
02130906	Patapsco River	<b>02141006</b>	<b>Savage River</b>
<b>02130907</b>	<b>Liberty Reservoir</b>	<b>05020201</b>	<b>Youghiogheny River</b>
02130908	S Branch Patapsco	05020202	Little Youghiogheny River
02131001	Magothy River	05020203	Deep Creek Lake watershed
02131002	Severn River	<b>05020204</b>	<b>Casselman River</b>





**Figure 5.**

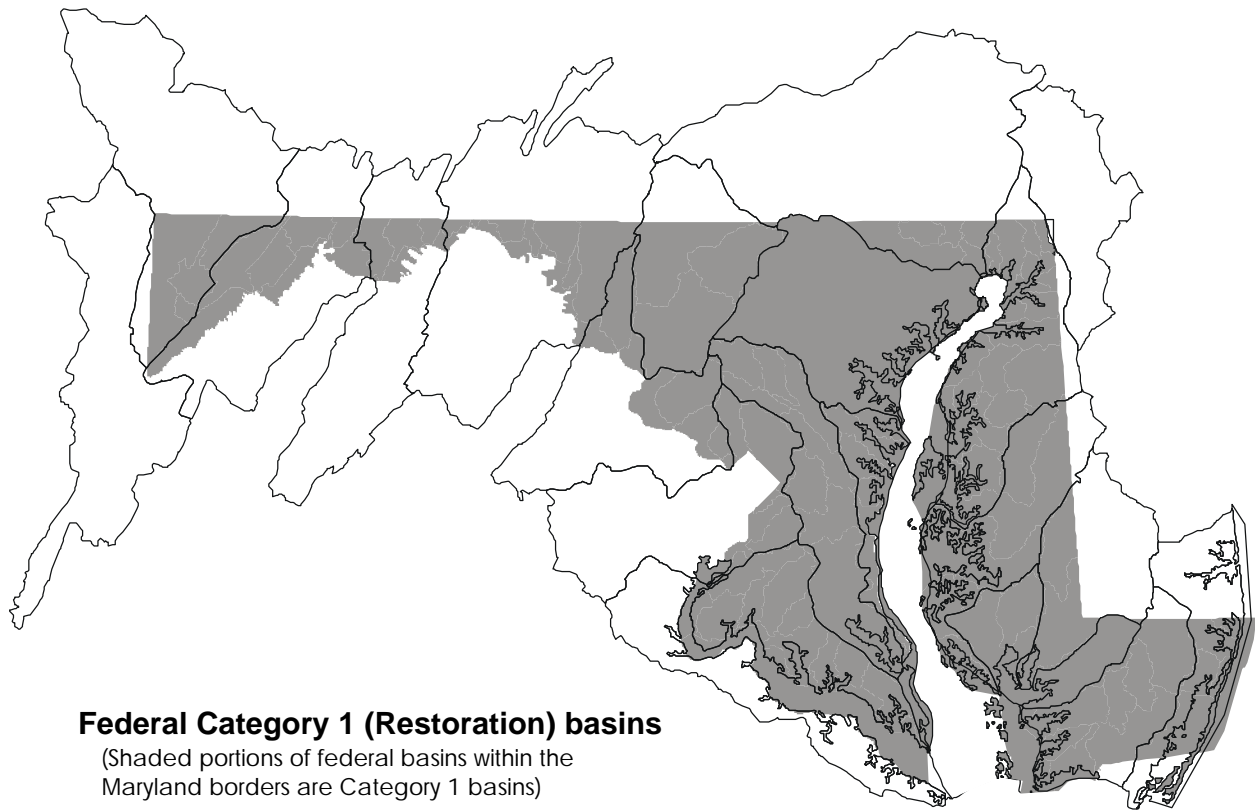
### Results - Federal Basin Level

In aggregating information from the smaller Maryland watersheds to the larger federal basins, the Clean Water Action Plan guidance was followed. Thus, federal Category 1 basins include those where the area of component Maryland Category 1 watersheds comprise at least 15 percent of the area of the federal basin (in Maryland). In following this guidance, all of the federal basins in Maryland with any significant size are identified as Category 1 watersheds.

The State's interpretation of the Unified Watershed Assessment guidelines is that a federal basin can be placed in only one of the four Categories. If a federal basin has characteristics of both Category 1 and Category 3, it will be listed as Category 1 in the federal compilation. This same decision rule is applied to Category 2 watersheds as well as Category 4 watersheds (of which there are none in Maryland). Therefore, for purposes of reporting results aggregated to the level of the federal basins, we place each federal basin only in one category, Category 1 (**Table 7; Figure 6**).

**Table 7. Federal Category 1 (Restoration) basins** (NOTE: segments are ordered by watershed code)

Federal HUC	Basin Name	Federal HUC	Basin Name
02050301	Lower Susquehanna	02060006	Patuxent
02060010	Chincoteague	02070011	Lower Potomac
02060009	Pocomoke	02070010	Middle Potomac-Anacostia-Occoquan
02060007	Blackwater-Wicomico	02070008	Middle Potomac-Catoctin
02060008	Nanticoke	02070009	Monocacy
02060005	Choptank	02070004	Conococheague-Opequon
02060002	Chester-Sassafras	02070003	Cacapon-Town
02060003	Gunpowder-Patapsco	02070002	North Branch Potomac
02060004	Severn	05020006	Youghiogheny



**Figure 6.**

## WATERSHED RESTORATION PRIORITIES

After identifying all watersheds that do not meet clean water or other natural resource goals (Category 1 Watersheds), the Clean Water Action Plan calls for the selection of the set of these watersheds that are most in need of restoration during the next two years. These are defined as Category 1 Priority Watersheds. Furthermore, the schedule for these restoration and protection actions must be coordinated with the State's schedule to determine Total Maximum Daily Loads for pollutants from watersheds on the Section 303(d) of the Clean Water Act.

### Results - State Watershed Level

The Clean Water Action Plan Technical Workgroup reviewed a number of methods for identifying Priority Watersheds. As results generated for each method was examined, it was determined that the different methods produced similar results when selecting priority watersheds. This produced confidence that the overall approach actually reflects the condition of the watersheds (and their need for restoration) and not just the particular method selected.

Category 1 Priority Watersheds were defined as watersheds that failed to meet at least half of their goals; i.e., at least half of the indicators had values failing to meet Category 1 benchmarks listed in **Table 1**. This method gives full consideration of all watersheds (since it does not “penalize” regions for which fewer statewide data are available, such as the Coastal Bays) and it is simple to calculate. The principal drawback is that this method equally weighs all 17 indicators. As a result, if there are more indicators that relate to a particular aspect of watershed health; e.g. biological integrity, these areas could carry more weight in the ranking process.

The Technical Workgroup recognized that other factors also should be examined to see if they warrant including additional watersheds in the Category 1 Priority list. These included severity of impact (e.g. *Pfiesteria* outbreaks) and evaluation of new data. For these reasons, three additional watersheds were included in the Category 1 Priority list in the August draft report:

- **Transquaking River** - One of the three watersheds that experienced an outbreak of the toxic microorganism *Pfiesteria* in 1997 (the Manokin and Lower Pocomoke already are listed).
- **Georges Creek** - Some streams in this watershed have biological communities in exceptionally poor condition.
- **Deep Creek Lake** - Some streams in this watershed have biological communities in exceptionally poor condition - this does not apply to the biological condition of the lake itself.

Information received from the Bureau of Mines after the August 1998 draft report was produced was evaluated by the Technical Workgroup. These data showed that some streams in Western Maryland have biological communities in exceptionally poor condition; the Workgroup added the **Upper North Branch Potomac River** to the list of Category 1 Priority watersheds.

Comments received at public hearings held in the State in September and in writing were considered by the Technical Workgroup. The Department of Agriculture had identified the **Upper Choptank River** watershed as a priority watershed for potential nutrient loading to Chesapeake Bay. As other priority watersheds already were identified as Category 1 Priority watersheds, the Workgroup added this watershed after the October 1 draft report was produced.

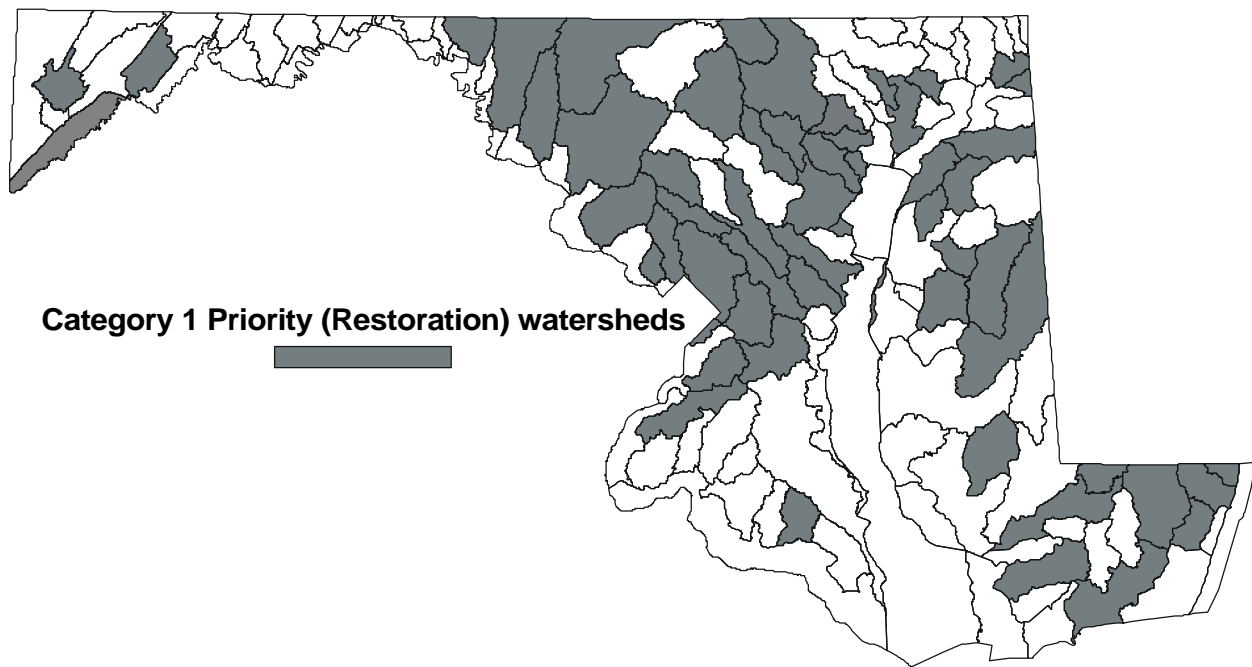
Members of the Technical Workgroup and some public comments received on the draft report suggested that watersheds that serve as part of significant public drinking water supplies also should be considered for restoration and protection. A committee of selected representatives of State and local government agencies examined these issues and recommended to the Workgroup that several watersheds be added to the Category 1 and 3 lists. The Workgroup reviewed this list and added five water supply watersheds as Category 1 Priority watersheds:

- **Loch Raven, Prettyboy and Liberty Reservoir watersheds** - These reservoirs provide water to Baltimore City and to some of the surrounding suburban areas. These watersheds are included in the Reservoir Protection Agreement designed to protect and restore water quality.
- **Rocky Gorge Dam (Duckett Reservoir) and Brighton Dam (Triadelphia Reservoir)** - These reservoirs provide water to the Maryland suburban area of Washington, DC through the Washington Suburban Sanitary Commission. These watersheds are included in the Patuxent Reservoir agreement to protect water quality.

These Category 1 Priority watersheds (**Table 8, Figure 7**) are recommended for restoration actions during the next two years. It is important to remember that many other Category 1 watersheds also warrant restoration actions. On-going and planned restoration activities in these watersheds will continue and that future efforts, funded by federal, State and local funds, will address these watersheds.

**Table 8. Category 1 Priority (Restoration) watersheds** (NOTE: segments are ordered by watershed code)

MD 8-digit Code	Watershed Name	MD 8-digit Code	Watershed Name
02130102	Assawoman Bay	02130902	Bodkin Creek
02130103	Isle of Wight Bay	02130903	Baltimore Harbor
02130105	Newport Bay	02130904	Jones Falls
02130202	Lower Pocomoke River	02130905	Gwynns Falls
02130203	Upper Pocomoke River	02130907	Liberty Reservoir
02130208	Manokin River	02131002	Severn River
02130301	Lower Wicomico River	02131003	South River
02130304	Wicomico River Head	02131102	Patuxent River middle
02130308	Transquaking River	02131103	Western Branch
02130404	Upper Choptank River	02131104	Patuxent River upper
02130405	Tuckahoe Creek	02131105	Little Patuxent River
02130503	Wye River	02131107	Rocky Gorge Dam
02130506	Langford Creek	02131108	Brighton Dam
02130507	Corsica River	02140104	Breton Bay
02130509	Middle Chester River	02140111	Mattawoman Creek
02130511	Kent Island Bay	02140203	Piscataway Creek
02130603	Upper Elk River	02140204	Oxon Creek
02130604	Back Creek	02140205	Anacostia River
02130610	Sassafras River	02140206	Rock Creek
02130611	Stillpond-Fairlee	02140207	Cabin John Creek
02130701	Bush River	02140208	Seneca Creek
02130704	Bynum Run	02140302	Lower Monocacy River
02130706	Swan Creek	02140303	Upper Monocacy River
02130802	Lower Gunpowder Falls	02140305	Catoctin Creek
02130803	Bird River	02140502	Antietam Creek
02130805	Loch Raven Reservoir	02140504	Conococheague Creek
02130806	Prettyboy Reservoir	02141004	Georges Creek
02130807	Middle River-Browns Ck	02141005	Upper N Br. Potomac R.
02130901	Back River	05020203	Deep Creek Lake



**Figure 7.**

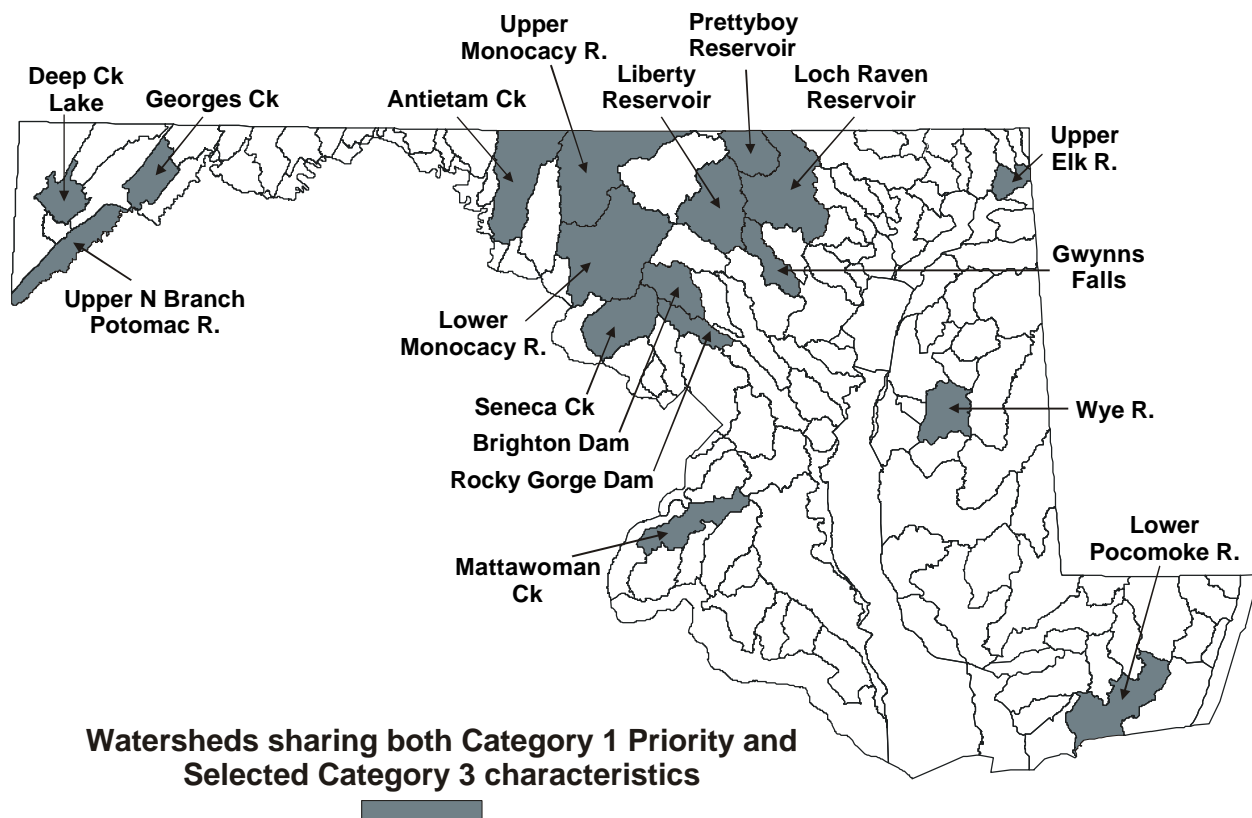
As discussed in a previous section, because of different criteria, some State watersheds qualify as both Restoration and Protection watersheds. Fewer watersheds are identified both as Category 1 Priority watersheds and Selected Category 3 watersheds (**Table 9; Figure 8**). The State considers that these watersheds deserve special attention in order to address degradation that already is experienced in some areas before the pristine resources in the watershed are lost.

**Table 9. Watersheds sharing Category 1 Priority and Selected Category 3 characteristics**

(NOTE: segments are ordered by watershed code)

MD 8-digit Code	Watershed Name
02130202	Lower Pocomoke River
02130503	Wye River
02130603	Upper Elk River
02130805	Loch Raven Reservoir
02130806	Prettyboy Reservoir
02130905	Gwynns Falls
02130907	Liberty Reservoir
02131107	Rocky Gorge Dam
02131108	Brighton Dam
02140111	Mattawoman Creek
02140208	Seneca Creek
02140302	Lower Monocacy River
02140303	Upper Monocacy River
02140502	Antietam Creek
02141004	Georges Creek
02141005	Upper N Branch Potomac River
05020203	Deep Creek Lake watershed

The committee reviewing proposals for Federal FY1999 and FY2000 Clean Water Action Plan funds will consider projects located in watersheds sharing both Category 1 Priority and Selected Category 3 listings identified in this report as a high priority. Projects located in a Category 1 Priority watersheds will be considered as a second priority for funding. There are other criteria that will be used to review projects for funding including: maximizing water quality, habitat protection/restoration and other natural resource goals; addressing locally defined geographic priorities at scales smaller than the 138 watersheds evaluated in the Unified Watershed Assessment; using Section 6217 (Coastal Zone Management) measures that are a required part of the coastal nonpoint source pollution program; addressing issues of statewide concern (e.g., nutrient management, habitat goals for wetlands, siting/operation of septic systems, acid mine drainage, growth management); help achieve water quality standards in areas listed on Maryland's 303(d) list; partnering (support/endorsement) with Tributary Teams; implement recommendations contained in an existing watershed restoration strategy; and located within or supporting an EQUIP priority area.



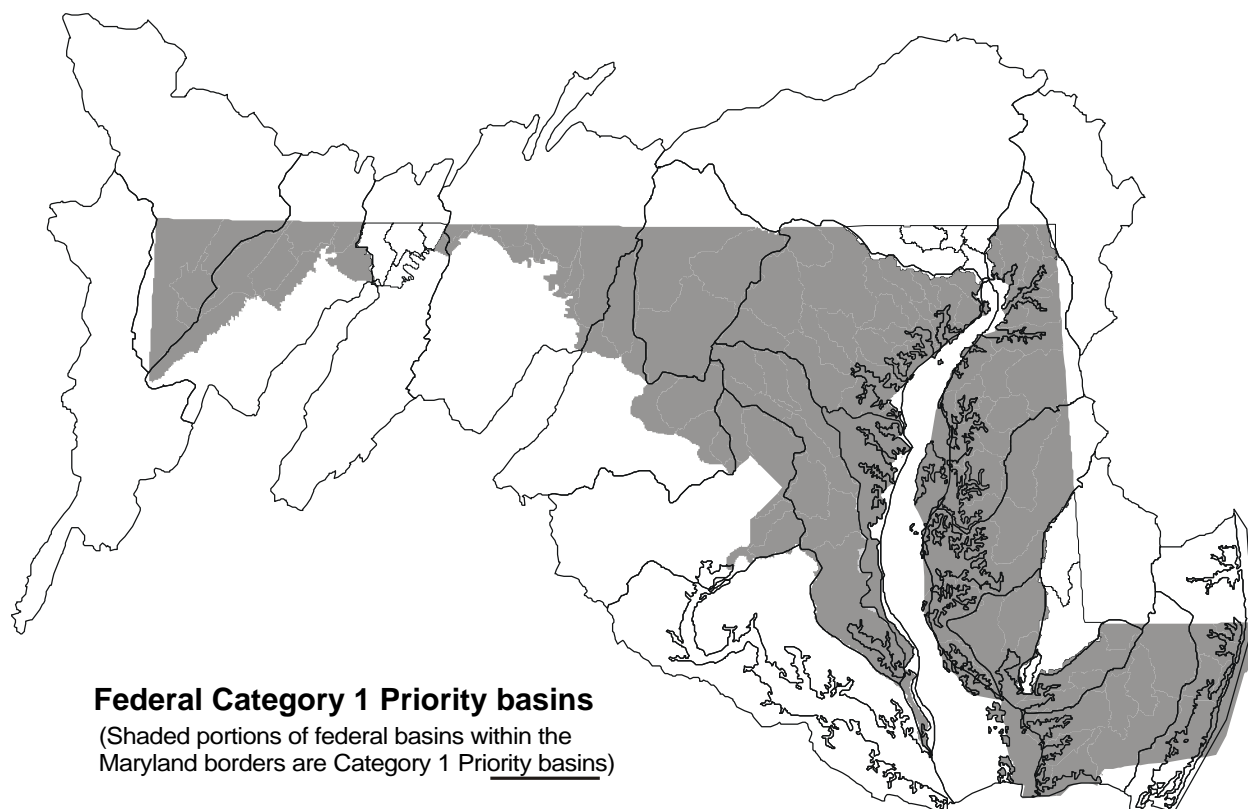
**Figure 8.**

## Results - Federal Basin Level

In terms of identifying federal Category 1 Priority basins, the same procedure used to identify federal Category 1 basins was used to aggregate information from the smaller Maryland watersheds to the larger federal basins. In following the federal Clean Water Action Plan guidance federal Category 1 Priority basins include those where the area of the State's Category 1 Priority watersheds comprise at least 15 percent of the area of the federal basin (within Maryland). In following this guidance, nearly all of the federal basins in Maryland with any significant size are identified as Category 1 Priority basins (**Table 10; Figure 9**).

**Table 10. Federal Category 1 Priority basins** (NOTE: Segments are ordered by watershed code)

Federal HUC Code	Basin Name	Federal HUC Code	Basin Name
02060010	Chincoteague	02060006	Patuxent
02060009	Pocomoke	02070010	Middle Potomac-Anacostia-Occoquan
02060007	Blackwater-Wicomico	02070008	Middle Potomac-Catoctin
02060005	Choptank	02070009	Monocacy
02060002	Chester-Sassafras	02070004	Conococheague-Opequon
02060003	Gunpowder-Patapsco	02070002	North Branch Potomac
02060004	Severn	05020006	Youghiogheny



**Figure 9.**

## **Results - Interstate Comparison**

A review of draft Clean Water Action Plan assessment reports from most every adjoining State (Delaware, Pennsylvania and West Virginia) and the District of Columbia, showed that, in spite of differing assessment methods, many of the federal watersheds that Maryland shares with these States are consistently identified as Category 1 (Restoration) watersheds. Assessment information from Virginia's draft report, which would address nearly half of the seventeen interstate federal watersheds, was not provided for analysis. Differences between State interpretation of watershed assessment categories were principally related to the amount of assessment information available.

Identifying Category 1 Priority watersheds in these draft reports showed considerably more variability between States as a result of regional water quality issues, local priorities and different approaches to prioritization. Pennsylvania had not completed their prioritization process. Delaware's prioritization process is governed by a formal consent decree with the US Environmental Protection Agency rather than water quality and other natural resource goals. It is expected that the federal Clean Water Action Plan report to Congress will address interstate variability in the assessment.

An example of a potential impact of different assessments of interstate watersheds was demonstrated in comments received from the Susquehanna River Basin Commission on the Maryland's draft Unified Watershed Assessment report. The letter noted that Pennsylvania might identify the Lower Susquehanna River basin as a Category 1 Priority watershed while Maryland identified its portion of the watershed as a Category 1 (Protection) watershed but not as a Category 1 Priority watershed.

This difference is mainly due to watershed scale and differences in land use with Maryland's portion of the Lower Susquehanna River basin being one of the smallest in the State. Maryland does recognize the importance of upstream activities to Susquehanna River water quality conditions that affect Chesapeake Bay and would support designation of the Lower Susquehanna River basin as a federal Category 1 Priority basin if funding opportunities for activities and discharges in the larger upstream portion of the watershed in Pennsylvania and New York would be affected by this designation. The State would consider similar support for other interstate basins where State assessment categories differ.



## PUBLIC INVOLVEMENT PROCESS

A Steering Committee has been formed to guide the Clean Water Action Plan process in Maryland. The Committee - made up of representatives from the USDA Natural Resources Conservation Service, the Department of Natural Resources, the Department of Environment, the Department of Agriculture, the Office of Planning, river commissions, Tributary Teams and local governments - outlined the principles that are guiding the State's development of Watershed Restoration Action Strategies.

In addition, a Technical Workgroup was formed to review existing information on watershed conditions and draft the Unified Watershed Assessment. The workgroup included a diverse group of interests: State agencies, local governments, Tributary Teams, environmental and watershed organizations, the Farm Bureau and others.

Outreach included six regional public meetings (**Appendix V**), hosted by Maryland's Tributary Teams, held around the State that reached over 300 people, including representatives of local governments, soil conservation districts, watershed organizations, educators, and citizens. Press releases were sent out to local newspapers, and meeting notices were sent to every county library in the State. Briefings have also been provided to the Tributary Teams, the Chesapeake Bay Program, watershed organizations, and other groups upon request.

In addition, the executive summary of the report was sent out to approximately 500 people. The executive summary and the report, background material, summary of comments and links to other Clean Water Action Plan sites are available to the public on the Department of Natural Resources web site: [www.dnr.state.md.us/cwap](http://www.dnr.state.md.us/cwap). A mirror site also will be available on the Department of the Environment's Internet site.

Public comments received to date have touched on a range of issues. Common concerns have included:

- the future impacts of growth on watersheds;
- the need to coordinate the many programs that address water quality and natural resources;
- the need to coordinate programs and restoration efforts across State boundaries;
- the need to better enforce existing regulations;
- the need for additional monitoring information on water bodies;
- the importance of protecting watersheds in good condition;
- the importance of public education on watershed restoration and protection;
- the importance of involving local governments that are responsible for making land use decisions; and
- site specific concerns about watershed conditions, water quality, and living resources.

Many of these comments relate to implementation, rather than assessment issues, and will be considered in the implementation phase. Public comments on this report were accepted through October 15, and were considered in final revisions to this report.

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## WATERSHED RESTORATION ACTION STRATEGIES

The State's long term objective is to have Watershed Restoration Action Strategies (WRAS) that are comprehensive, and address all aspects of watershed condition and water quality, including public health; aquatic living resources; physical habitat and the landscape.

A WRAS will provide information and guidance that will help the public, watershed organizations, and federal, state and local agencies focus their staff and monies in areas and on issues important to the public and that will result in measurable environmental improvement.

The strategies may be drawn from existing assessment and targeting efforts such as a county's comprehensive plan, stormwater and sewer plans, capital budgets, greenways and open space plans, watershed stewardship programs, site design standards/BMPs, erosion and sediment control plans, soil conservation district watershed work plans and other efforts.

A comprehensive strategy includes the following:

- A watershed-wide assessment of existing and anticipated future conditions that significantly affect water quality and natural resources. The assessment should identify the principal sources and relative contributions of point and nonpoint source pollution; major sources of habitat loss; and threats to drinking water; aquatic life, and natural resources critical to maintaining the integrity of the watershed.
- Measurable environmental and programmatic goals and a timeframe for achieving significant milestones/accomplishments.
- A public involvement process that provides mechanisms for informing the public and incorporating their concerns and priorities.
- A process for targeting individual projects for preventive or remedial activities (e.g. identifying appropriate areas to implement best management practices and buffer strips that will maximize the achievement of clean water and other natural resource goals.
- A water quality and natural resources monitoring element that utilizes existing and supplemental data sources to document current and future changes occurring in the watershed.
- A process to routinely evaluate the effectiveness of projects and/or systems and their progress toward achieving environmental and programmatic goals.

WRAS need to be developed for watersheds in need of protection and restoration. The State has a number of "strategies" at the state and local level that include recommendations for water quality and natural resource restoration or protection. These existing strategies can form the foundation for strengthened, more comprehensive strategies that will maximize benefits for water quality and natural resource goals in a more holistic, coordinated manner.

Many strategies contain recommended "on the ground" implementation efforts to improve water quality and meet other natural resource goals such as aquatic health and habitat. Strategy actions will be supported through new funds authorized by the *Clean Water Action Plan* and channeled through existing programs such as §319, as well as through other State and local programs. Watershed restoration strategies will be encouraged to:

- coordinate restoration strategies with TMDL's;
- address locally defined geographic priorities at smaller scales than the 134 watersheds evaluated in the Assessment;
- address an issue of statewide concern, such as nutrient reduction;
- rely on a partnership approach, including work with Tributary Teams and the Coastal Bays Program; and
- use Coastal Zone Management Act §6217 management measures.

Over the longer term, the Steering Committee will also address such outstanding issues as the potential for targeting additional funds to the Priority watersheds, future revisions to the Priority watershed list and the need to further coordinate the State's watershed restoration and protection efforts.

### **Pilot Lower Eastern Shore Conservation and Action Strategy**

The Lower Eastern Shore has been selected as a pilot area for the development of the State's first Clean Water Action Plan Strategy. The purpose of this strategy is to coordinate and help to focus both ongoing restoration and conservation activities and potential new restoration funding available under the federal program. The Lower Eastern Shore Action Strategy is being coordinated through the Lower Eastern Shore Tributary Team with the assistance of State agencies. Local governments, the Tributary Team, Delaware state agencies, and other interested citizens and organizations will also be involved in strategy development and implementation.

The initial phase the action strategy will take the analysis in the Unified Watershed Assessment to a more detailed scale, comparing watersheds within the region to identify those most in need of restoration action, those with the greatest conservation values, and opportunities for restoration and protection. Such opportunities might include economic development interests, tourism and recreation initiatives, or the presence of a watershed association already involved in related activities. Since specific local water quality problems require specific solutions, the second phase of strategy development will be to match appropriate tools and new federal funding to particular projects in the impacted watersheds.

## CONCLUSIONS

The federal Clean Water Action Plan has stimulated a comprehensive statewide assessment of Maryland's watersheds including a diverse set of factors addressing all aspects of watershed condition. This assessment has involved a broad spectrum of participants from local, state and federal agencies and representatives of many private organizations.

Much additional work to refine our assessment procedures remains to be done, since the time provided to accomplish this initial assessment has been very brief, given the magnitude of the undertaking. As mentioned above, review and evaluation of the available data, some of which is preliminary, will continue. In addition, these data will be supplemented by comments and suggestions from the public workshops, additional local and regional watershed data, and data obtained through mutual exchange with surrounding jurisdictions for interstate watersheds. As a result, the findings and conclusions contained in this report, including watershed restoration priorities, can be expected to undergo modification in the future.

The potential benefits of this approach for Maryland's watersheds are significant. The results of this process will ultimately provide a comprehensive framework which other programs can utilize to conduct coordinated activities on individual watershed issues. These benefits will only increase with the further evolution of the Clean Water Action Plan's Watershed Approach.

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## GLOSSARY

Anadromous - word characterizing fish which migrate up rivers from ocean or estuarine waters to spawn

Benthic (n. benthos)- plants or animals living on or closely associated with the bottom of a body of water

Buffered Streams - Streams with trees or other vegetation growing along the shore

Chlorophyll a - the green pigment found in plant cells used as an indication of algae growth

Headwaters - the small streams that are the source of rivers

Impervious - solid land surfaces (parking lots, streets, roof top, etc.) that cannot be infiltrated by precipitation runoff like rain or snow melt

Maryland Water Monitoring Council (MWMC) - A statewide collaborative body made up of local, state and public representatives to help achieve effective collection, interpretation, and dissemination of aquatic resource monitoring data

Metadata - information about data that describes the data and why it has been collected, and defines variables, methods, calculations and units

Nutrient loadings - the total mass or weight of nitrogen and phosphorus inputs to a waterbody

*Pfiesteria* - a recently discovered microorganism potentially capable of producing a toxic chemical that is harmful to aquatic living resources and humans

Secchi depth - a measurement of water clarity using a white and black Secchi disk lowered into the water until it disappears from view

Smart Growth - Governor Glendening's initiative to attract new development to areas where environmental impacts can be minimized and existing public infrastructure best utilized.

Soil Erodibility - a measure of the ease with which soil is washed or carried away

Submerged Aquatic Vegetation (SAV) - vascular plants growing beneath the water

Tributary Strategies Teams - 10 groups, appointed by Governor Glendening, comprised of citizens, farmers, educators, environmentalists, and state and local government representatives that address efforts to reduce excess nutrients entering the Chesapeake Bay and tributaries

Unbuffered streams - streams which lack trees or other vegetation growing along the shore

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## APPENDIX I

### Relationship between Maryland watersheds and federal Hydrologic Unit basins

MD 8-digit Code	Watershed Name	Federal Hydrologic Unit Code	Basin Name
02050301	Conewago Creek	02050306	Lower Susquehanna
02120201	L. Susquehanna River		
02120202	Deer Creek		
02120203	Octoraro Creek		
02120204	Conowingo Dam-Susq. Run		
02120205	Broad Creek		
02130101	Atlantic Ocean	02060010	Chincoteague
02130102	Assawoman Bay		
02130103	Isle of Wight Bay		
02130104	Sinepuxent Bay		
02130105	Newport Bay		
02130106	Chincoteague Bay		
02130201	Pocomoke Sound	02060009	Pocomoke
02130202	Lower Pocomoke River		
02130203	Upper Pocomoke River		
02130204	Dividing Creek		
02130205	Nassawango Creek		
02130206	Tangier Sound		
02130207	Big Annemessex River		
02130208	Manokin River		
02130301	Lower Wicomico River	02060007	Blackwater-Wicomico
02130302	Monie Bay		
02130303	Wicomico Creek		
02130304	Wicomico River Headwaters		
02130307	Fishing Bay		
02130308	Transquaking River		
02130305	Nanticoke River	02060008	Nanticoke
02130306	Marshyhope Creek		
02130401	Honga River	02060005	Choptank
02130402	Little Choptank		
02130403	Lower Choptank		
02130404	Upper Choptank		
02130405	Tuckahoe Creek		
02130501	Eastern Bay	02060002	Chester-Sassafras
02130502	Miles River		
02130503	Wye River		
02130504	Kent Narrows		
02130505	Lower Chester River		
02130506	Langford Creek		
02130507	Corsica River		
02130508	Southeast Creek		
02130509	Middle Chester River		
02130510	Upper Chester River		
02130511	Kent Island Bay		
02130601	Lower Elk River		
02130602	Bohemia River		
02130603	Upper Elk River		
02130604	Back Creek		
02130605	Little Elk Creek		
02130606	Big Elk Creek		
02130608	Northeast River		
02130609	Furnace Bay		
02130610	Sassafras River		
02130611	Stillpond-Fairlee		
02130607	Christina River	02040205	Brandywine-Christina

# APPENDIX I - continued

MD 8-digit Code	Watershed Name	Federal Hydrologic	
		Unit Code	Basin Name
02130701	Bush River	02060003	Gunpowder-Patapsco
02130702	Lower Winters Run		
02130703	Atkisson Reservoir		
02130704	Bynum Run		
02130705	Aberdeen Proving Grounds		
02130706	Swan Creek		
02130801	Gunpowder River		
02130802	Lower Gunpowder Falls		
02130803	Bird River		
02130804	Little Gunpowder Falls		
02130805	Loch Raven Reservoir		
02130806	Prettyboy Reservoir		
02130807	Middle River - Browns Ck		
02130901	Back River		
02130902	Bodkin Creek		
02130903	Baltimore Harbor		
02130904	Jones Falls		
02130905	Gwynns Falls		
02130906	Patapsco River L N Br		
02130907	Liberty Reservoir		
02130908	S Branch Patapsco		
02131001	Magothy River	02060004	Severn
02131002	Severn River		
02131003	South River		
02131004	West River		
02131005	West Chesapeake Bay		
02131101	Patuxent River lower	02060006	Patuxent
02131102	Patuxent River middle		
02131103	Western Branch		
02131104	Patuxent River upper		
02131105	Little Patuxent River		
02131106	Middle Patuxent River		
02131107	Rocky Gorge Dam		
02131108	Brighton Dam		
02139996	Upper Chesapeake Bay	02060001	Upper Chesapeake Bay
02139997	Middle Chesapeake Bay		
02139998	Lowerer Chesapeake Bay		
02140101	Potomac River L tidal	02070011	Lower Potomac
02140102	Potomac River M tidal		
02140103	St. Mary's River		
02140104	Breton Bay		
02140105	St. Clements Bay		
02140106	Wicomico River		
02140107	Gilbert Swamp		
02140108	Zekiah Swamp		
02140109	Port Tobacco River		
02140110	Nanjemoy Creek		
02140111	Mattawoman Creek		
02140201	Potomac River U tidal	02070010	Middle Potomac-Anacostia-Occoquan
02140203	Piscataway Creek		
02140204	Oxon Creek		
02140205	Anacostia River		
02140206	Rock Creek		
02140202	Potomac River MO Cnty	02070008	Middle Potomac-Catoctin
02140207	Cabin John Creek		
02140208	Seneca Creek		
02140301	Potomac River FR Cnty		
02140305	Catoctin Creek		

# APPENDIX I - continued

MD 8-digit Code	Watershed Name	Federal Hydrologic Unit Code	Basin Name
02140302	Lower Monocacy River	02070009	Monocacy
02140303	Upper Monocacy River		
02140304	Double Pipe Creek		
02140501	Potomac River WA Cnty	02070004	Conococheague-Opequon
02140502	Antietam Creek		
02140503	Marsh Run		
02140504	Conococheague Creek		
02140505	Little Conococheague		
02140506	Licking Creek		
02140507	Tonoloway Creek		
02140509	Little Tonoloway Creek		
02140508	Potomac River AL Cnty	02070003	Cacapon-Town
02140510	Sideling Hill Creek		
02140511	Fifteen Mile Creek		
02140512	Town Creek		
02141001	Potomac R Lower N Branch	02070002	North Branch Potomac
02141002	Evitts Creek		
02141003	Wills Creek		
02141004	Georges Creek		
02141005	Potomac R Upper N Branch		
02141006	Savage River		
05020201	Youghiogheny River *	05020006	Youghiogheny
05020202	Little Youghiogheny R		
05020203	Deep Creek Lake		
05020204	Casselman River *		

NOTE: \* The Youghiogheny River watershed (05020201) includes a small portion of the federal Hydrologic Unit identified as the Cheat River basin.

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## APPENDIX II

### List of contacts sent requests for supplemental data

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Dr. Chandler Robbins, Patuxent Wildlife Research Center  
Dr. Christi Korbeck, National Aquarium in Baltimore  
Dr. Christopher Swarth, Jug Bay Wetlands Sanctuary  
Dr. Christopher Victoria, US Fish and Wildlife Service, Chesapeake Bay Field Office  
Dr. Cortez White, Washington Suburban Sanitary Commission  
Dr. D.L. Burley, Potomac Edison Company  
Dr. David Correll, Smithsonian Environmental Research Center  
Dr. Donald A. Munson, Washington College, Dept. of Biology  
Dr. Donald Boesch, Univ. MD, CES, Horn Point Environmental Lab  
Dr. Donald C. Helm, Morgan State University, Dept. of Civil Engineering  
Dr. Edythe M. Humphries, SWQAC  
Dr. Eileen Setzler-Hamilton, Univ. MD, Chesapeake Biological Laboratory  
Dr. Eric L. Hildebrand, Friends of Gwynns Falls Park / SWQAC  
Dr. Gail Webb Owings, Kent Co. Dept. of Planning and Zoning Administration  
Dr. Gary R. Chirlin, Chirlin and Associates, Inc.  
Dr. George Wilmot, SWQAC  
Dr. Gordon Smith, Johns Hopkins University, Applied Physics Laboratory  
Dr. J. Charles Baummer, Jr., EA Engineering Science and Technology, Inc. / SWQAC  
Dr. Jack Greer, MD Sea Grant, Univ. MD  
Dr. James Adams, Univ. MD Eastern Shore, Natural Resources Dept.  
Dr. James Allen, University of DC  
Dr. James H. Gilford, SWQAC  
Dr. Joan Wohlgemuth, Friends of St. Leonard Creek  
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Dr. Linda Silversmith, League of Women Voters of MD / SWQAC  
Dr. Mark Southerland, Versar, Inc.  
Dr. Mary Jo Kishter, Loiderman Assoc., Inc.  
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Dr. Nancy Paige Smith, Citizens Monitors of St. Mary's Co., St. Mary's College  
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Dr. Peter Bergstrom, Magothy River Association  
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Dr. Tuck Hines, Smithsonian Environmental Research Center  
Dr. W.I. Tittle, Citizens for the Preservation of Queenstown Creek  
Dr. William Ball, Johns Hopkins University, Dept. of Geography and Env. Engineering  
Mr. Al Haines, Eastalco Aluminum Company / SWQAC  
Mr. Alfred C. Wein, Jr., Cecil Co. Dept. of Planning  
Mr. Ananda Ranasinghe, Versar, Inc.  
Mr. Andy Nichols, Monocacy Watershed Conservancy  
Mr. Axel Schwendt, W.R. Grace Co. / SWQAC

## Appendix II - (continued) supplemental data requests

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Mr. Ben Fusaro, Wicomico Environmental Trust  
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Mr. Charles E. Smyser, Cecil Co. Environmental Health Dept.  
Mr. Charles Gillian, Baltimore City Health Dept., Community Environmental Health  
Mr. Charles Zeleski, Carroll Co. Health Department / SWQAC  
Mr. Charlie Conklin, SWQAC  
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Mr. Christopher M. Porteus, St. Phillip's Episcopal Church  
Mr. Clark Aist, Mataponi Basin Citizen's Association  
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Mr. Edgar E. Harman, Garrett Co. Environmental Health Dept.  
Mr. Edgar W. Woods, Frederick Co. Environmental Health Dept.  
Mr. Edward Birkmire, Kent Co. Environmental Health Dept.  
Mr. Edward Krueger, Potomac Electric Power Co. / SWQAC  
Mr. Edward Phillips, SWQAC  
Mr. Edward Tudor, Worcester Co. Planning, Permits and Inspections  
Mr. Floyd Spellman, Sassafras River Community Council  
Mr. Frank Gunion, Worcester Co. Citizen's Coalition  
Mr. Frank Jaklitsch, Calvert Co. Dept. of Planning and Zoning  
Mr. Frank L. Wise, Prince Georges' Co. Health Department / SWQAC  
Mr. Frank R. Henderson, Hartford Co. Dept. of Public Works, Environmental Affairs Division  
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Mr. Gary David, Charles Co. Environmental Health Dept.  
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Mr. Gerald Seinwell, Apogee Research  
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Mr. James Herriman, Calvert Co. Environmental Health Dept.  
Mr. James Odgers, Plum Point Environmental Land Trust  
Mr. James R. Martin, Jr., Severn River Association  
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## Appendix II - (continued) supplemental data requests

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Mr. Joseph Mendelson, Bethlehem Steel Corp.  
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## Appendix II - (continued) supplemental data requests

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## Appendix II - (continued) supplemental data requests

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Ms. JoanKean, Somerset Dept. of Planning and Zoning  
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Ms. Katrina Myers,Nevamar Co.  
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Ms. LizMcWethy, Weems Creek Conservancy  
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Patuxent Naval Air Station, Dept. of Public Works

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## **Appendix III**

### **Definitions of Restoration (Category 1) Indicators**

#### **Clean Water Requirements**

##### *303(d) List*

Section 303(d) of the federal Water Pollution Control Act requires states to develop a prioritized list of waterbodies that currently do not meet water quality standards, or will not meet water quality standards after all technology-based controls are in place. The State of Maryland developed its list and it was approved by the US Environmental Protection Agency in December 1996. It includes 130 waterbodies across the state. The water bodies are impaired by one or more of the following pollutants: nutrients, sediments, toxic substances, acidity or fecal coliform bacteria. This indicator is the number of occurrences on the 303(d) List for a watershed. If a watershed is listed at least once on the 303(d) list, it receives a Category 1 rating for this indicator.

#### **Water Quality**

##### *Monitored Nutrient Concentrations: eutrophication*

This index is a mean of current status (1994-96) information, scored according to a 10-level scale (one - most degraded to 10 - best condition) for mixed layer total nitrogen, total phosphorus and total suspended solids. Values are consolidated into a single mean for each major tidal tributary. Watersheds whose score value is in the lower 25 percent of scores for the 138 watersheds receive a Category 1 rating for this indicator.

##### *Monitored Nutrient Concentrations: habitat*

This index is the mean of current status (1994-1996) information, scored according to a 10-level scale (one - most degraded to 10 - best condition), for surface chlorophyll a, Secchi depth and summer (July - September) dissolved oxygen levels at the bottom. Values are consolidated into a single mean for each major tidal tributary. Watersheds whose score value is in the lower 25 percent of scores for the 138 watersheds receive a Category 1 rating for this indicator.

##### *Modeled Nitrogen and Phosphorus Loading Rate*

Values reported are from the Chesapeake Bay Program's Phase IV Watershed Model and the MD Department of Natural Resources' (DNR) Integrated Watershed Analysis and Management System (IWAMS). The value includes loadings for both point and nonpoint sources and is represented in pounds per watershed acre. Watersheds whose loading rate is in the top 25 percent of the watersheds receive a Category 1 rating for this indicator.

#### **Aquatic Living Resources**

##### *SAV Abundance*

This is determined by measuring the extent of areas with SAV growth each year. Using the 1996 aerial survey results, the area of current SAV was divided by the acreage corresponding to the Tier III restoration goal (restoring SAV to 2 meters depth). This value was multiplied by 10 to yield a value between one and 10 (one - most degraded, 10 - best condition). Watersheds with a score of one receive a Category 1 rating for this indicator.

## **Appendix III (continued) - Definitions of Category 1 indicators**

### **Aquatic Living Resources - continued**

#### *SAV Habitat Index*

This index is determined using 1994 to 1996 Chesapeake Bay Program Bay segments passing, failing and borderline to the habitat requirements for SAV. The scores are adjusted to range between one and 10 (one - most degraded, 10 - best condition). Watersheds with a score less than 7 receive a Category 1 rating for this indicator.

#### *Tidal Benthic Index of Biotic Integrity*

This indicator is scored based on measures of species diversity, species composition, productivity, and trophic composition. Scores are adjusted to range between one and 10 (one - most degraded, 10 - best condition). Watersheds with a score less than 6 receive a Category 1 rating for this indicator.

#### *Tidal Fish Index of Biotic Integrity*

This indicator is scored based on total number of species, number of species comprising 90 percent of the catch, number of species in the bottom trawl, anadromous fish abundance, estuarine fish abundance, total fish abundance less menhaden, proportion of planktivores, proportion of carnivores, and proportion of benthivores. Data are ranked within sites and a score is assigned based on the severity of the impact. Scores are adjusted to range between 1 and 10 (1 most degraded, 10 best condition). Watersheds whose score value is in the lower 25 percent of scores for the applicable watersheds receive a Category 1 rating for this indicator.

#### *Anadromous Fish Index*

This indicator is scored based on the number of ecologically valuable anadromous and semi-anadromous fish caught per haul. Data are ranked within sites and a score is assigned based on the severity of the impact. Scores are adjusted to range between 1 and 10 (one - most degraded, 10 - best condition). Watersheds whose score value is in the lower 25 percent of scores for the applicable watersheds receive a Category 1 rating for this indicator.

#### *Non-Tidal Benthic Index of Biotic Integrity*

This indicator is developed using Maryland Biological Stream Survey (MBSS), Targeted Watershed Project, and Rapid Bioassessment Program data. Comparable sampling and scoring methods are used to develop an index from these programs. Scores for watersheds are reported as means for the sites within each watershed (one - most degraded, 10 - best condition). Watersheds with a score less than 6, and whose number of samples taken was at least 4, receive a Category 1 rating for this indicator.

#### *Non-Tidal Fish Index of Biotic Integrity*

This indicator is developed from Maryland Biological Stream Survey and Targeted Watershed Project data. Fish are collected using the same methods in both of these programs. Scores for watersheds are reported as means for the sites within each watershed (one - most degraded, 10 - best condition). Watersheds with a score less than 6, and whose number of samples taken was at least 4, receive a Category 1 rating for this indicator.

## **Appendix III (continued) - Definitions of Category 1 indicators**

### **Aquatic Living Resources - continued**

#### *Non-Tidal Instream Habitat Index*

This indicator is based on seven measures of instream habitat quality that are scored for each site based on observations of habitat condition in streams during sample visits. The seven habitat measures rate the quantity and quality of physical habitat available in the stream for fish and benthic macroinvertebrate colonization and rate the degree to which the stream channel has been altered due to alterations in watershed landscape. A mean for these seven measures is calculated for each site, and the mean habitat score for watersheds on a one to 10 scale is reported (one - most degraded, 10 - best condition). Watersheds whose score value is in the lower 25 percent receive a Category 1 rating for this indicator.

### **Landscape Indicators**

#### *Percent Impervious Surface*

This landscape indicator is defined as the percent imperviousness for a watershed normalized by land acres. Watersheds whose percent imperviousness value is in the top 25 percent of the watersheds receive a Category 1 rating for this indicator.

#### *Population Density*

This landscape indicator is defined as the State Office of Planning's (MOP) year 2000 projected population for the county, reallocated by DNR to watershed scale and normalized by land acres. Watersheds whose population density value is in the top 25 percent of the watersheds receive a Category 1 rating for this indicator.

#### *Historic Wetland Loss Density*

This landscape indicator is defined as the total acres of hydric soils for a watershed, extracted from MOP's county soils data. Watersheds whose historic wetland loss value is in the top 25 percent of the watersheds receive a Category 1 rating for this indicator.

#### *Percent Unbuffered Streams*

This indicator is defined as the area of unbuffered streams in a watershed normalized by stream length. Watersheds whose percent unbuffered streams value is in the top 25 percent of the watersheds receive a Category 1 rating for this indicator.

#### *Soil Erodibility*

This indicator is developed based on an area's slope, soil erodibility factor, distance to nearest stream and land use type. If a watershed scores in the high (score between 0.275 and 0.314) or very high (score between 0.314 and 0.37) classification, it receives a Category 1 rating for this indicator.

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## Appendix III (continued)

### Definitions of Protection (Category 3 ) Indicators

#### Aquatic Living Resources

##### *Tidal Fish Index of Biotic Integrity*

This indicator is scored based on total number of species, number of species comprising 90 percent of the catch, number of species in the bottom trawl, anadromous fish abundance, estuarine fish abundance, total fish abundance less menhaden, proportion of planktivores, proportion of carnivores, and proportion of benthivores. Data are ranked within sites and a score is assigned based on the severity of the impact. Scores are adjusted to range between one and 10 (one - most degraded, 10 - best condition). Watersheds whose score value is in the upper 25 percent of scores receive a Category 3 rating for this indicator.

##### *Non-Tidal Instream Habitat Index*

This indicator is based on seven measures of instream habitat quality that are scored for each site based on observations of habitat condition in streams during sample visits. The seven habitat measures rate the quantity and quality of physical habitat available in the stream for fish and benthic macroinvertebrate colonization and rate the degree to which the stream channel has been altered due to alterations in watershed landscape. A mean for these seven measures is calculated for each site, and the mean habitat score for watersheds on a one to 10 scale is reported (one - most degraded, 10 best condition). Watersheds whose score value is in the upper 25 percent of scores receive a Category 3 rating for this indicator.

##### *Non-Tidal Fish Index of Biotic Integrity*

This indicator is developed from Maryland Biological Stream Survey and Targeted Watershed Project data. Fish are collected using the same methods in both of these programs. Scores for watersheds are reported as means for the sites within each watershed (one most degraded, 10 best condition). Watersheds with a score greater than 8, and whose number of samples taken was at least 4, receive a Category 3 rating for this indicator.

##### *Imperiled Aquatic Species Indicator*

This living resources indicator rates watersheds according to number and diversity of aquatic species listed as rare, endangered, threatened, or otherwise of special concern. Scores range from 0 to 10. Watersheds with a score greater than 0 receive a Category 3 rating for this indicator.

##### *Migratory Fish Spawning Area*

This living resources indicator rates watersheds based on the diversity of spawning habitat for American Shad, Hickory Shad, Blueback Herring, White Perch, Striped Bass, and Yellow Shad. This indicator scores watersheds based on the number of migratory fish species (0-7) that spawn within the watershed (0 - most degraded, 7 - best condition). Watersheds with a score greater than 0 receive a Category 3 rating for this indicator.

##### *Anadromous Fish Index*

This indicator is scored based on the number of ecologically valuable anadromous and semi-anadromous fish caught per haul. Data are ranked within sites and a score is assigned based on the severity of the impact. Scores are adjusted to range between one and 10 (one - most degraded, 10 - best condition). Watersheds whose score value is in the upper 25 percent of scores receive a Category 3 rating for this indicator.

## **Appendix III (continued) - Definitions of Category 3 indicators**

### **Aquatic Living Resources - continued**

#### *Wetland-Dependent Species*

This indicator is the weighted average number of vertebrate species dependent on a wetland area normalized by NWI wetland area (acres). Watersheds whose wetland-dependent species value is in the top 25 percent of the watersheds receive a Category 3 rating for this indicator.

#### *Trout Spawning Area*

This living resources indicator identifies watersheds where populations of brown, rainbow, and brook trout are known to reproduce. Scores range between one and 10 (one - most degraded, 10 - best condition). Watersheds with a score greater than 0 receive a Category 3 rating for this indicator.

#### *Fish Hatchery Water Supply*

This indicator is the number of fish hatchery water supplies in the watershed. Watersheds that have the presence of fish hatchery water supplies receive a Category 3 rating for this indicator.

### **Landscape Indicators**

#### *Percent Headwater Streams Occurring in Interior Forest*

This indicator is defined as the number (feet) of first order (Strahler method) streams within interior forest divided by the first order stream length (feet). Watersheds whose percent headwater streams occurring in interior forest value is in the top 25 percent of the watersheds receive a Category 3 rating for this indicator.

#### *Percent Watershed Forested*

This indicator is defined as the number of 1994 forested acres within a watershed divided by the total land acres in a watershed. Watersheds whose percent watershed forested value is in the top 25 percent of the watersheds receive a Category 3 rating for this indicator.

#### *Wildland Acres*

This indicator is the number (acres) of MD DNR wildlands in the watershed. Watersheds that have the presence of wildlands receive a Category 3 rating for this indicator.

#### *Number of Drinking Water Intakes*

This indicator is the number of drinking water intakes in the watershed. Watersheds that have the presence of drinking water intakes receive a Category 3 rating for this indicator.

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## APPENDIX IV

### Example Unified Watershed Assessment watershed profile

#### *Georges Creek*

#### GENERAL INFORMATION

Maryland Eight Digit Watershed Code:.....	<b>02141004</b>	Tributary. Basin:.....	<b>UPPER POTOMAC</b>
<u>Population (1990 US Census)</u> .....		<u>Water Type (Households) (1990 US Census)</u>	
1990 Est. Population Density (per land acre).....	21	Public.....	5,556
.....		.....	Drilled Well
.....	403		
<u>1994 Land Use (MOP Data)</u> .....		Other Water.....	210
Urban Acres.....	8,750		
Agricultural Acres.....	5,719	<u>Sewer Type (Households) (1990 US ,Census)</u>	
Forest Acres.....	33,230	Public.....	5,681
Wetland Acres.....	0	Septic.....	485
Barren Acres.....	0	Other.....	53
Total Acres (non-water).....	47,699		

#### WATERSHED INDICATORS

Category I Parameters	303d List.....	Category III Parameters
<u>Water Quality</u>		<u>Aquatic Living Resources</u>
Monitored Nutrient Concentrations		Tidal Fish Index of Biotic Integrity.....
-eutrophication.....	-	Non-Tidal Instream Habitat Index.....
-habitat.....	-	Non-Tidal Fish Index of Biotic Integrity.....
Modeled Nitrogen Load (Rate/acre in lbs).....	4.29	Imperiled Aquatic Species Indicator.....
Modeled Phosphorus Load (Rate/acre in lbs).....	0.37	Migratory Fish Spawning Area.....
<u>Aquatic Living Resources</u>		Anadromous Fish Index.....
SAV Abundance.....	-	Wetland-Dependent Species.....
SAV Habitat Index.....	-	Trout Spawning Area.....
Tidal Benthic Index of Biotic Integrity.....	-	Fish Hatchery Water Supply.....
Tidal Fish Index of Biotic Integrity.....	-	
Anadromous Fish Index.....	-	<u>Landscape Parameters</u>
Non-Tidal Benthic Index of Biotic Integrity.....	3.67	% Headwater Streams in Interior Forest.....
Non-Tidal Fish Index of Biotic Integrity.....	3.33	% Watershed Forested.....
Non-Tidal Instream Habitat Index.....	5.97	Wildland Acres.....
<u>Landscape Parameters</u>		Number of Drinking Water Intakes.....
Percent Impervious Surface.....	0.10	
Population Density.....	0.21	
Historic Wetland Loss Density.....	4.0	
Unbuffered Stream Density.....	38.0	
Soil Erodibility.....	0.31	
<u>Clean Water Requirements</u>		

#### Recommended Unified Watershed Assessment Categories

Priority Category 1.....	Yes
Category 2.....	No
Select Category 3.....	Yes

**APPENDIX IV continued - (watershed profile - Georges Creek-02141004)**



## Appendix V

**Public outreach meetings** Source: Internet site notice ([www.dnr.state.md.us/cwap/](http://www.dnr.state.md.us/cwap/))

### How can I get involved in the Clean Water Action Plan?

As part of the federal Clean Water initiative, the State of Maryland, in cooperation with local governments, watershed organizations and other stakeholders, has developed a draft Clean Water Action Plan to help guide the State's watershed management efforts. Through this process, the State has created a draft list of priority watersheds needing restoration. Restoration strategies will be developed for these priority watersheds that will include an action plan for restoration.

How can you get involved in this process? We need additional information from people who know their local watersheds. During the month of September, six regional meetings will be held throughout the State hosted by the State's Tributary Strategy Teams. You are encouraged to attend these meetings, learn about the Clean Water Action Plan, contribute local information about the condition of rivers and streams in these watersheds and send us your comments about the process. The list, location and of meetings follows. For further information about the public meetings, contact Darlene Walker at (410) 260-8708.

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#### Schedule of public meetings

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<b>Upper Marlboro</b>	Frederick Douglas High School Croom Road Wednesday, September 2, 7-9pm
<b>Cumberland</b>	Allegany Community College, Continuing Ed. Bldg., Rooms 12,13 and 14 State Route 46 Wednesday, September 9, 7-9pm
<b>Baltimore</b>	Essex Community College, Lecture Hall 7201 Rossville Blvd. Thursday, September 10, 7-9pm
<b>Easton</b>	Chesapeake College, Performing Arts Center lobby Intersection of US Routes 213 and 50 Wednesday, September 16, 7-9pm
<b>Frederick</b>	Winchester Hall, First Floor Public Hearing Room Church Street, 1 block east of Market Street Wednesday, September 23, 7-9pm
<b>Salisbury</b>	Salisbury State University, Caruther's Room South on US 13, first right past Benedict's Flowers Tuesday, September 29, 7-9pm

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